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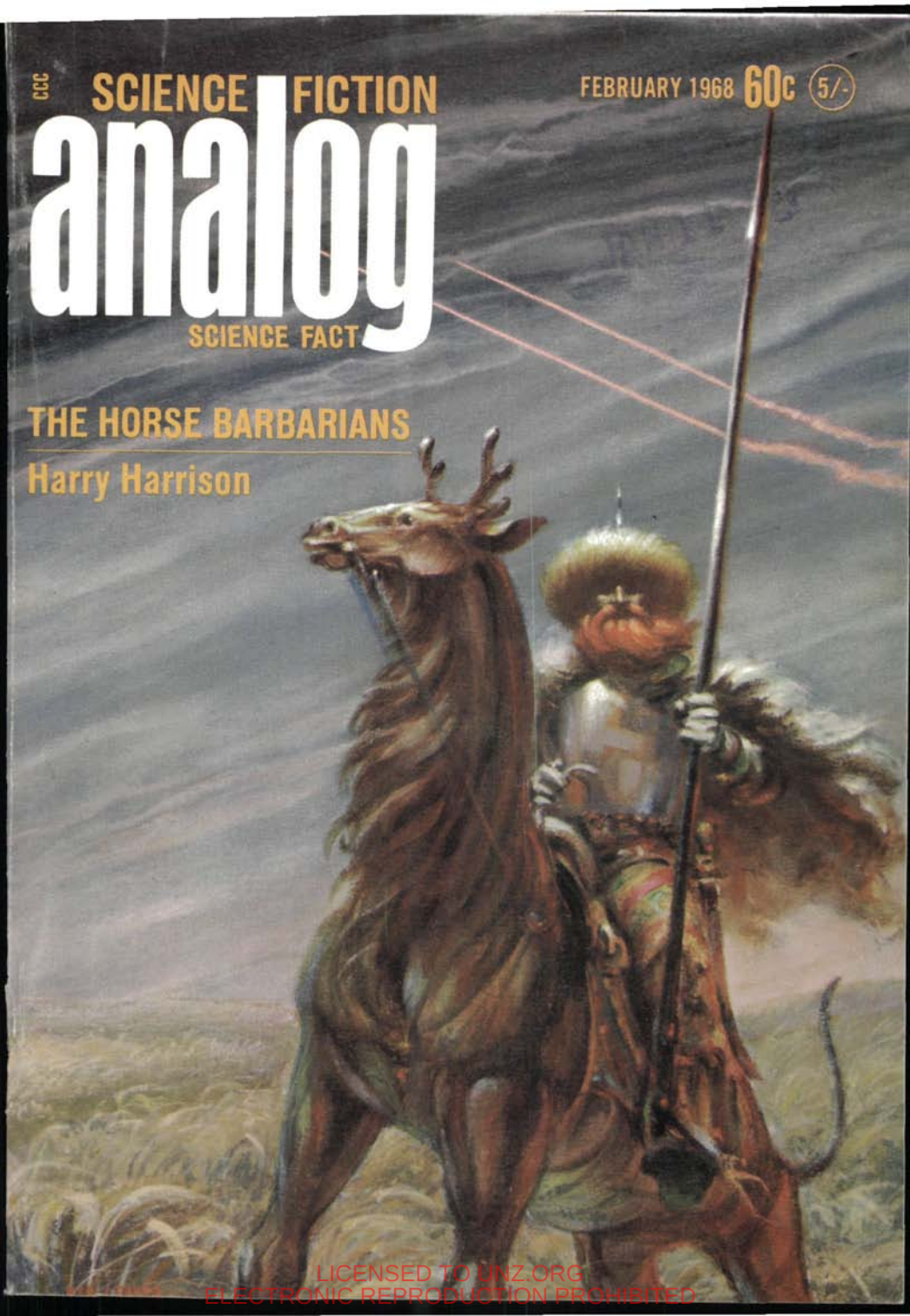
THE HORSE BARBARIANS

Harry Harrison



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Democracy

EDITORIAL BY JOHN W. CAMPBELL

Anytime people get the idea that any one system or idea is The One Right Solution to All Problems, they're headed for Trouble, Grade A, Class 1.

The One Best Solution always has limits, conditions, and dangers.

Nuclear power is a great way of generating lots of energy with a small mass of fuel—provided you don't make it too compact.

If a man has a bad heart, carrying some nitroglycerin around with him is a good idea—but not by the pint.

There are circumstances where any One Best Solution turns out to generate Impossible Problems.

Jewish organizations have long been among the world's most staunch supporters of democratic systems—but right now they're up against an Impossible Problem created by the concepts of Democracy. The "Impossible" characteristics reflect back and make it extremely upsetting for them, because the only practical solution to the impossibility is to deny the all-out-and-always validity of Democracy, which is emotionally extremely distasteful to them.

First, recognize clearly that the six-day war of last summer was truly, absolutely, and one hundred percent an anti-Semitic war. Inasmuch as the Arabs are Semites, and the Jews were fighting them, it was unarguably one hundred percent anti-Semitic, no matter which side you were on.

The Jewish Semites, however, have wandered over the Earth for many centuries—almost two millennia—and have learned the lessons of Western science, technology and culture—lessons that have deeply modified the original Judaic cultural traditions.

The Muslim Semites, however, have wandered only over the very limited ranges of their Middle-Eastern countries, and have strongly and quite successfully resisted Western culture, science and technology.

The result is that the cultural split between the two groups is very wide indeed; the Arab Semites now follow ways far closer to the ways of the desert nomad people led by Moses and Aaron than do the Jews.

Muhammad himself, originally a camel-caravan master, would have

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been quite at home with Joseph's brethren going into the Egypt of the Pharoahs.

David Ben-Gurion would certainly not be.

Fundamentally, the split between Arabs and Jews—both true Semitic peoples, both revering Moses and the Old Testament—is a matter of the split between a technologically modified cultural pattern—the modern Jews—and the Old Traditional cultural pattern. The split is deep and emotional; it is deeper even than religion—which is, after all, only one facet of any cultural pattern, however important a pattern-facet it may be.

And herein lieth the problem that is an Impossible Problem of Democracy. The Arab peoples, at a very deep, personal level, reject their fellow Semites who have perverted, blasphemed against, the Old Traditional Ways.

Consider for a moment what would happen if Nasser announced that he was making a true treaty of peace with Israel—that his Egyptian government was ready to accept the reality of the world-situation, and admit that Israel—unpleasant as the idea might be to him—did exist as a going, organized, and powerful nation.

Sitting over here, we may think of Nasser as a totalitarian style dictator, imposing his arrogant and arbitrary will on his helpless people.

Sit on his "throne" for a while, and see how completely untrue that is! It's no "throne"—it's the Egyptian Hot Seat. Egypt has much too much Democratic feeling among the people to allow Nasser to make them accept any decrees—any acts—of his that they do not personally like.

And accepting the existence of a strong, capable Israeli nation is something they most violently do *not* like.

If Nasser signed a treaty with Israel—thereby acknowledging the real-world fact that Israel does exist—the Egyptian people would, if he were lucky, throw him in the Suez Canal and see if he could make it across. In any case he would most certainly and suddenly be thrown out of power, his government and its acts instantly denied, and the treaty with Israel declared to be the private act of a madman, having nothing to do with Egypt.

If King Hussein of Jordan—a monarch, and therefore appearing to the more extreme believers in Pure Democracy as being necessarily an evil tyrant ruling his people with a brutal hand—tried to sign such a treaty, he might survive because he is a thoroughly modern, and highly competent and courageous king; he can and does fly his own jet planes. He might be able to make it out of Jordan before the people caught him.

Any treaty he signed would be rejected instantly—and the mere

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The Horse Barbarians

HARRY HARRISON

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Part I of III.

The Horse Barbarian people hate cities — and the Horse Barbarians of Felicity, a bleak, 1.5G world, were hard, cold, and tough enough to make their hate deadly!

Illustrated by Kelly Freas

I

Guard Lieutenant Talenc lowered the electronic binoculars and twisted a knob on their controls, turning up the intensity to compensate for the failing light. The glaring white sun dropped behind a thick stratum of clouds, and evening was close, yet the image intensifier in the binoculars presented a harshly clear, black-and-white image of the undulating plain. Talenc cursed under his breath and swept the heavy instrument back and forth. Grass, a sea of wind-stirred, frost-rimed grass. Nothing.

"I'm sorry, but I didn't see it, sir," the sentry said, reluctantly. "It's always just the same out there."

"Well I saw it—and that's good enough. Something moved and I'm going to find out what it is." He lowered the binoculars and glanced at his watch. "An hour and a half until it gets dark, plenty of time. Tell the officer of the day where I've gone."

The sentry opened his mouth to say something, then thought better of it. One did not give advice to Guard Lieutenant Talenc. When the gate in the charged wire fence opened, Talenc swung up his laser rifle, settled the grenade case firmly on his belt, and strode forth. A man secure in his own strength, a one-time unarmed combat champion, and veteran of uncounted brawls. Positive that there was nothing in this vacant expanse of plain that he could not take care of.

He had seen a movement, he was sure of that, a flicker of motion that had drawn his eye. It could have been an animal; it cou'd have been anything. His decision to investigate was prompted as much by the boredom of the guard routine as by curiosity. Or duty. He stamped solidly through the crackling grass, and turned only once to look back at the wire-girt camp. A handful of

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low buildings and tents, with the skeleton of the drill tower rising above them, while the clifflike bulk of the spaceship shadowed it all. Talenc was not a sensitive man, yet even he was aware of the minuteness of this lonely encampment, set into the horizon-reaching plains of emptiness. He snorted and turned away. If there was something out here, he was going to kill it.

A hundred meters from the fence there was a slight dip, followed by a rising billow, an irregularity in the ground that could not be seen from the camp. Talenc trudged to the top of the hillock and gaped down at the group of mounted men who were concealed behind it.

He sprang back instantly, but not fast enough. The nearest rider thrust his long lance through Talenc's calf, twisted the barbed point in the wound and dragged him over the edge of the embankment. Talenc pulled up his gun as he fell, but another lance drove it from his hand and pierced his palm, pinning it to the ground. It was all over very quickly, one second, two seconds, and the shock of pain was just striking him when he tried to reach for his radio. A third lance through his wrist pinioned that arm.

Spread-eagled, wounded, and dazed by shock, Guard Lieutenant Talenc opened his mouth to cry aloud, but even this was denied him. The nearest rider leaned over casually and thrust a short saber between Talenc's teeth, deep into the roof of his mouth, and his voice was stilled forever. His leg jerked as he died, rustling a clump of grass, and that was the only sound that marked his passing. The riders gazed down upon him silently, then turned away with complete lack of interest. Their mounts, though they stirred uneasily, were just as silent.

"What is all this about?" the officer of the guard asked, buttoning on his weapon belt.

"It's Lieutenant Talenc, sir. He went out there. Said he saw something, and then went over a rise. I haven't seen him since, maybe ten, fifteen minutes now, and I can't raise him on the radio."

"I don't see how he can get into any trouble out there," the officer said, looking out at the darkening plain. "Still—we had better bring him in. Sergeant,"—a man stepped forward and saluted—"take a squad out and find Lieutenant Talenc."

They were professionals, signed on for thirty years with John Company, and they expected only trouble from a newly opened planet. They spread out as skirmishers and moved warily away across the plain.

"Anything wrong?" the metallurgist asked, coming out of the drill hut with an ore sample on a tray.

"I don't know . . ." the officer said, just as the riders swept out of the concealed gully and around both sides of the knoll.

It was shocking. The guardsmen,

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trained, deadly and well armed, were overrun and destroyed. Some shots were fired, but the riders swung low on their long-necked mounts, keeping the animals' thick bodies between themselves and the guns. There was the twang of suddenly released bowstrings and the lances dipped and killed. The riders rolled over the guardsmen and rode on, leaving nine twisted bodies behind them.

"They're coming this way!" the metallurgist shouted, dropping the tray and turning to run. The alarm siren began to shriek and the guards poured out of their tents.

The attackers hit the encampment with the sudden shock of an earthquake. There was no time to prepare for it, and the men near the fence died without lifting their weapons. The attackers' mounts clawed at the ground with pillarlike legs and hurled themselves forward; one moment a distant threat, the next an overwhelming presence. The leader hit the fence, its weight tearing it down even as electricity arced brightly and killed it, its long thick neck crashing to the ground just before the guard officer. He stared at it, horrified, for just an instant before the creature's rider planted an arrow in his eye socket and he died.

Murder, whistling death. They hit once and were gone, sweeping close to the fence, leaping the body of the dead beast, arrows pouring in a dark stream from their short, laminated bows. Even in the half darkness, from the backs of their thundering, heaving mounts their aim was excellent. Men died, or dropped, wounded. One arrow even tore into the gaping mouth of the siren so that it rattled and moaned down into silence.

As quickly as they had struck they had vanished, out of sight in the ravine behind the shadowed rise, and, in the stunned silence that followed, the moans of the wounded were shockingly loud.

The light was almost gone from the sky now and the darkness added to the confusion. When the glow tubes sprang on the camp became a pool of bloody murder set into the surrounding night. Order was restored only slightly when Bardovy, the expedition's commander, began bellowing instructions over the bullhorn. While the medics separated the dying from the dead, mortars were rushed out and set up. One of the sentries shouted a warning and the big battlelamp was turned on—and revealed the dark mass of riders gathering again on the ridge.

"Mortars, fire!" the commander shouted with wild anger. "Hit them hard . . ."

His voice was drowned out as the first shells hit, round after round poured in until the dust and smoke boiled high and the explosions rolled like thunder.

They did not yet realize that the

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first charge had been only a feint, and that the main attack was hitting them from the opposite side of the camp. Only when the beasts were in among them and they began to die did they know what had happened. Then it was too late.

"Close the ports!" the duty pilot shouted, from the safety of the spacer's control room high above, banging the air-lock switches as he spoke. He could see the waves of attackers sweeping by, and he knew how lethargic was the low-geared motion of the ponderous outer doors. He kept pushing at the already closed switches.

In a wave of shrieking, brute flesh, the attackers rolled over the charged fence. The leading ones died and were trampled down by the beasts behind, who climbed their bodies, thick claws biting deep to take hold. Some of the riders died as well, and they appeared to be as dispensable as their mounts, for the others kept on coming in endless waves. They overwhelmed the encampment, filled it, destroyed it.

"This is Second Officer Weiks," the pilot said, activating all the speakers in the ship. "Is there any officer aboard who ranks me?" He listened to the growing silence and when he spoke again his voice was choked and unclear.

"Sound off in rotation, officers and men, from the engine room north. Sparks, take it down."

Hesitantly, one by one, the voices checked in, while Weiks activated the hull scanners and looked at the milling fury below.

"Seventeen—that's all," the radio operator said with shocked unbelief, his hand over the microphone. He passed the list to the second officer who looked at it bleakly, then slowly reached for the microphone.

"This is the bridge," he said. "I am taking command. Run the engines up to ready . . ."

"Aren't we going to help them?" a voice broke in. "We can't just leave them out there."

"There is no one out there to leave," Weiks said slowly. "I've checked on all the screens and there is nothing visible down there except these . . . attackers and their beasts. Even if there were I doubt if there is anything we could do to help. It would be suicide to leave the ship And we have only a bare skeleton flight crew aboard as it is."

The frame of the ship shivered as if to add punctuation to his words.

"One of the screens is out—there goes another—they hit it with something. And they're fixing lines to the landing legs. I don't know if they can pull us over—and I don't want to find out. Secure to blast in sixty-five seconds."

"They'll burn in our jets, everything, everyone down there," the radio operator said, snapping his harness tight.

"Our people won't feel it," the pilot said grimly, "and . . . let's see how many of the others we can get."

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When the spacer rose, spouting fire, it left a smoking, humped circle of death below it. But, as soon as the ground was cool enough, the waiting riders pressed in and trampled through the ash. More and more of them, appearing out of the darkness. There seemed no end to their teeming numbers.

II

"Pretty stupid to get hit by a sawbird," Brucco said, helping Jason dinAlt to pull the ripped metalcloth jacket off over his head.

"Pretty stupid to try and eat a peaceful meal on this planet," Jason snapped back, his words muffled by the heavy cloth. He pulled the jacket free and winced as sharp pain cut into his side. "I was just trying to enjoy some soup, and the bowl got in the way when I had to fire."

"Only a superficial wound," Brucco said, looking at the red gash on Jason's side. "The saw bounced off the ribs without breaking them. Very lucky."

"You mean lucky I didn't get killed. Whoever heard of a sawbird in the messhall?"

"Always expect the unexpected on Pyrrus, even the children know that." Brucco sloshed on antiseptic and Jason ground his teeth together tightly. The phone pinged and Meta's worried face appeared on the screen.

"Jason—I heard you were hurt."

"Dying," he told her, grimacing.

Brucco sniffed loudly. "Nonsense. Superficial wound, fourteen centimeters in length, no toxins."

"Is that all," Meta said, and the screen went dark.

"Yes, that's all," Jason said bitterly. "A liter of blood and a kilo of flesh, nothing more bothersome than a hangnail. What do I have to do to get some sympathy around here—lose a leg?"

"If you lost a leg in combat there might be sympathy," Brucco said coldly, pressing an adhesive bandage into place. "But, if you lost a limb to a sawbird in the messhall, you would expect only contempt . . ."

"Enough," Jason said sharply, pulling his jacket back on. "Don't take me so literally and, yes, I know all about the sweet consideration I can expect from you friendly Pyrrans. I don't think I'll ever miss this planet, not for five minutes."

"You're leaving?" Brucco asked, brightening up. "Is that what the meeting is about?"

"Don't sound so wildly depressed at the thought. Try to control your impatience until 1500 hours when the others will be here. I play no favorites. Except myself that is," he added, walking out stiffly, trying to move his side as little as possible.

It was time for a change, he thought, looking out of a high window across the perimeter wall, to the deadly jungle beyond. Some light sensitive cells must have

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caught the motion because a tree branch whipped forward and a sudden flurry of thorndarts rattled against the transparent metal of the window. His reflexes were so well trained by now that he did not move a muscle.

Past time for a change. Every day on Pyrrus was another spin of the wheel. Winning was just staying even, and when your number came up it was certain death. How many people had died since he had first come here? He was beginning to lose track, to become as indifferent to death as any Pyrran.

If there were going to be any changes made, he was the one who would have to make them. He had thought once that he had solved this planet's deadly problems, when he had proved to them that the relentless, endless war was their own doing. Yet it still went on. Knowledge of the truth does not always mean acceptance of it.

The Pyrrans who were capable of accepting the reality of existence here had left the city, and had gone far enough away to escape the pressure of physical and mental hatred that still engulfed it. Because, although the remaining Pyrrans might give lip-service to the concept that their own emotions were keeping the war going, they did not really believe that this was true. And each time they looked out at the world that they hated, the enemy gained fresh strength and pressed the attack anew.

When Jason thought of the only possible end for the city he grew depressed. There were so many of the people left who would not accept the change—or help of any kind. They were as much a part of this war, and as adapted to the war as the hyperspecialized life forms outside. Molded in the same way, by the same generations of mixed hatred and fear.

There was one more change coming. He wondered how many of them would accept it.

It was 1520 hours before Jason made his appearance in Kerk's office: he had been delayed by a last minute exchange of messages on the jump-space communicator. Everyone in the room shared the same expression: cold anger. Pyrrans had very little patience and even less tolerance for a puzzle or a mystery. They were so alike—yet so different.

Kerk, gray-haired and stolid, able to control his expression better than the others. Practice, undoubtedly, from dealing so much with off-worlders. This was the man whom it was most important to convince because, if the slap-dash, militaristic Pyrran society had any leader at all, he was the one.

Brucco, hawk faced and lean, his features set in a perpetual expression of suspicion. The expression was justified. As physician, researcher and ecologist, he was the single authority on Pyrran life forms. He had to be suspicious.

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Though at least there was one thing in his favor: he was scientist enough to be convinced by reasoned fact.

And Rhes, leader of the outsiders, the people who had adapted successfully to this deadly planet. He was not possessed by the reflex hatred that filled the others, and Jason counted upon him for help.

Meta, sweet and lovely, stronger than most men, whose graceful arms could clasp with passion—or break bones. Does your coldly practical mind—hidden in that beautiful female body—know what love is? Or is it just pride of possession you feel towards the offworlder, Jason dinAlt? Tell him some time, he would like to know. But not right now. You look just as impatient and deadly as the others.

Jason closed the door behind him and smiled insincerely.

"Hello there everybody," he said. "I hope you didn't mind my keeping you waiting?" He went on quickly, ignoring the angry growls from all sides.

"I'm sure that you will all be pleased to hear that I am broke, financially wiped out, and sunk."

Their expressions cleared as they considered the statement. One thought at a time—that was the Pyrran way.

"You have millions in the bank," Kerk said, "and no way of gambling and losing them."

"When I gamble I win," Jason informed him with calm dignity. "I am broke because I have spent every last credit. I have purchased a spaceship, and it is on its way here now."

"Why?" Meta asked, speaking the question that was foremost in all their minds.

"Because I am leaving this planet and I'm taking you—and as many others as possible—with me."

Jason could read their mixed feelings easily. For better or for worse—and it was certainly worse than any other planet in the known galaxy—this was their home. Deadly and dangerous, but still theirs. He had to make his idea attractive, to gain their enthusiasm and make them forget any second thoughts that they might have. The appeal to their intelligence would come later, first he must appeal to their emotions. He knew well this single chink in their armor.

"I've discovered a planet that is far more deadly than Pyrrus."

Brucco laughed with cold disbelief, and they all nodded in agreement with him.

"Is that supposed to be attractive?" Rhes asked, the only Pyrran present who had been born outside the city, and was, therefore, immune to their love of violence. Jason gave him a long, slow wink to ponder over while he went on to convince the others.

"I mean deadly because it contains the most deadly life form ever discovered. Faster than a stingwing, more vicious than a horndevil, more

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tenacious than a clawhawk—there's no end to the list. I have found the planet where these creatures abide . . ."

"You are talking about men, aren't you?" Kerk said, quicker to understand than the others, as usual.

"I am. Men who are more deadly than the ones here, because Pyrrans have been bred by natural selection to defend themselves against any dangers. *Defend.* What would you think of a world where men have been bred for some thousands of years to attack, to kill and destroy, without any thought of the consequences? What do you think the survivors of this genocidal conflict would be like?"

They considered it, and from their expressions they did not think very much of the idea. They had taken sides, united against a common enemy in their thoughts, and Jason hurried on while he had them in agreement.

"I'm talking about a planet named Felicity, apparently called this to sucker in the settlers, or for the same reason that big men are called Tiny. I read about it some months back in a newsfax, just a small item about an entire mining settlement being wiped out. This is a hard thing to do, mining operation teams are tough and ready for trouble—and John Company is the toughest. Also—and equally important—John Company does not play for small stakes. So I got in touch with some friends and sent them some money to spread around, and they managed to contact one of the survivors. It cost me a good deal more to get accurate information from him, but it was well worth it. Here it is." He paused for dramatic effect and held up a sheet of paper.

"Well read it, don't just wave it at us," Brucco said, tapping the table irritably.

"Have patience," Jason told him. "This is an engineer's report, and it is very enthusiastic in a restrained, engineering way. Apparently Felicity has a wealth of heavy elements, near the surface, and confined to a relatively restrained area. Opencut mining should be possible and, from the way this engineer talks, the uranium ore sounds like it is rich enough to run a reactor without any refining . . ."

"That's impossible," Meta broke in. "Uranium ore in a free state could not be so radioactive that it could . . ."

"Please," Jason said, holding both hands in the air. "I was just making a small exaggeration to emphasize a point. The ore is rich, let it go at that. The important thing now is that, in spite of the quality of the ore, John Company is not returning to Felicity. They had their fingers burned once, badly, and there are plenty of other planets they can mine with a lot less effort. Without having to face dragon-riding barbarians who appear suddenly out of the ground and attack

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in endless waves, destroying everything they come near."

"What is all that last bit supposed to mean?" Kerk asked.

"Your guess is as good as mine. This is the way the survivors described the massacre. The only thing we can be sure about is that they were attacked by mounted men, and that they were licked."

"And this is the planet you wish us to go to," Kerk said. "It does not sound attractive. We can stay here and work our own mines."

"You've been working your mines for centuries, until some of the shafts are five kilometers deep and producing only second-rate ore —but that's not the point. I'm thinking about the people here, and what is going to happen to them. Life on this planet has been irreversibly changed. The Pyrrans who were capable of making an adjustment to the new conditions have done so. Now—what about the others?"

Their only answer was a protracted silence.

"It's a good question, isn't it? And a pertinent one. I'll tell you what's going to happen to the people left in this city. And when I tell you, try not to shoot me. I think you have all outgrown that kind of instant reflex to a difference of opinion. At least I hope that everyone in this room has. I wouldn't tell this to the people out there in the city. They would probably kill me rather than hear the truth. They don't want to find out that they are all condemned to certain death by this planet."

There was the thin whine of an electric motor as Meta's gun sprang halfway out of its power holster, then slipped back. Jason smiled at her and waggled his finger: she turned away coldly. The others controlled their trigger reflexes better.

"That is not true," Kerk said. "People are leaving the city . . ."

"And returning in about the same numbers. Argument invalid. The ones who were able to leave have done so, only the hard core is left."

"There are other possible solutions," Brucco said. "Another city could be constructed . . ."

The rumble of an earthquake interrupted him. They had been feeling tremors for some time, so commonplace on Pyrrus that they were scarcely aware of them, but this one was much stronger. The building moved under them and a jagged crack appeared on the wall, showering down cement dust. The crack intersected the window frame and, although the single pane was made of armorglass, it fractured under the strain and crashed out in jagged fragments. As though on cue, a stingwing dived at the opening, ripping through the protective netting inside. It dissolved in a burst of flame as their guns surged from their power holsters and four shots fired as one.

"I'll watch the window," Kerk

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said, shifting his chair so he could face the opening. "Go on."

The interruption, the reminder of what life in this city was really like, had thrown Brucco off his pace. He hesitated a moment, then continued.

"Yes . . . well, what I was saying . . . other solutions are possible. A second city, quite distant from here, could be constructed, perhaps at one of the mine sites. Only around this city are the life forms so deadly. This city could be abandoned and . . ."

"And the new city would recapitulate all the sins of the old. The hatred of the remaining Pyrrans would recreate the same situation. You know them better than I do, Brucco, isn't that what would happen?"

Jason waited until Brucco had nodded a reluctant yes.

"We've been over this ground before and there is only one possible solution. Get those people off Pyrrus and to a world where they can survive without a constant, decimating war. *Any* place would be an improvement over Pyrrus. You people are so close to it that you seem to have forgotten what a hell this planet really is. I know that it's all that you have, and that you're adjusted to it, but it is really not very much. I've proven to you that all of the life forms here are telepathic to a degree, and that your hatred of them keeps them warring upon you. Mutating and changing and constantly getting more vicious and deadly. You have admitted that. But it doesn't change the situation. There are still enough of you Pyrrans hating away to keep the war going. Sanity save me—but you are a pigheaded people! If I had any brains, I would be well away from here and leave you to your deadly destiny. But I'm involved, like it or not. I've kept you alive and you've kept me alive and our futures run on the same track. Besides that, I like your girls." Meta's sniff was loud in the listening silence.

"So—jokes and arguments aside, we have a problem. If your people stay here, they will eventually die. All of them. To save them you are going to have to get them away from here, to a more friendly world. Habitable planets with good natural resources are not always easy to find, but I've found one. There may be some differences of opinion with the natives, the original settlers, but I think that should make the idea more interesting to Pyrrans rather than the other way around. Transportation and equipment are on the way. Now who is in with me? Kerk? They look to you for leadership. Now—lead!"

Kerk squinted his eyes dangerously at Jason and tightened his lips with distaste. "You always seem to be talking me into doing things I do not really want to do."

"A measure of maturity," Jason said blandly. "The ego rising tri-

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umphant over the id. Does that mean that you will help?"

"It does. I do not want to go to another planet and I do not enjoy the thought. Yet I can see no other way to save the people in the city from certain extinction."

"Good. And you, Brucco? We'll need a surgeon."

"Find another one. My assistant, Teca, will do. My studies of the Pyrran life forms are far from complete. I am staying in the city as long as it is here."

"It could mean your life."

"It probably will. However my records and observations are indestructible."

No one doubted that he meant it —or attempted to argue with him. Jason turned to Meta.

"We'll need you to pilot the ship after the ferry crew has been returned."

"I'm needed here to operate our Pyrran ship."

"There are other pilots, you've trained them yourself. And, if you stay here, I'll have to get myself another woman . . ."

"I'll kill her if you do. I'll pilot the ship."

Jason smiled and blew her a kiss that she pretended to ignore. "That does it then," he said. "Brucco will stay here, and I guess Rhes will also stay to supervise the settling of the city Pyrrans with his people."

"You have guessed wrong," Rhes told him. "The settlements are now handled by a committee and going as smoothly as can be expected. I have no desire to remain—what is the word?—a backwoods rube for the rest of my life. This new planet sounds very interesting and I am looking forward to the experience."

"That is the best news I have heard today. Now let's get down to facts. The ship will be here in about two weeks, so if we organize things now we should be able to get the supplies and people aboard and lift soon after she arrives. I'll write up an announcement that loads the dice as much as possible in favor of this operation, and we can spring it on the populace. Get volunteers. There are about twenty thousand people left in the city, but we can't get more than about two thousand into the ship—it's a demothballed, armored, troop carrier called the *Pugnacious,* left over from one of the Rim Wars—so we can pick and choose the best. Establish the settlement and come back for the others. We're on our way."

Jason was stunned, but no one else seemed surprised.

"Four hundred and eighty-five volunteers—including Grif, a nine-year-old boy—out of how many thousand? It just isn't possible."

"It is possible on Pyrrus," Kerk said.

"Yes, it's possible on Pyrrus, but only on Pyrrus." Jason paced the room, with a frustrating, dragging step in the doubled gravity, smacking his fist into his open palm.

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"When it comes to unthinking reflex and sheer bullheadedness this planet really wins the plutonium-plated prize. 'Me born here. Me stay here. Me die here. Ugh.' Ugh is right!" He spun about to stab his finger at Kerk—then grabbed at his calf to rub away the cramp brought on by overexertion in the heightened gravity.

"Well we're not going to worry about them," he said. "We'll save them in spite of themselves. We'll take the four hundred and eighty-five volunteers and we'll go to Felicity, and we'll lick the planet and open the mine—and come back for the others."

He slumped in the chair, massaging his leg, as Kerk went out.

"I hope . . ." he mumbled under his breath.

III

Muffled clanking sounded in the air lock as the transfer station mechanics fastened the flexible tubeway to the spacer's hull. The intercom buzzed as someone plugged into the hull jack outside.

"Transfer Station 70 Ophiuchi to *Pugnacious*. You are sealed to tubeway which is now pressurized to ship standard. You may open your outer port."

"Stand by for opening," Jason said, and turned the key in the override switch that permitted the outer port to be open at the same time as the inner one.

"Good to be back on dry land," one of the ferry crewmen said as they came into the lock, and the others laughed uproariously, as though he had said something exceedingly funny. All of them, that is, except for the pilot, who scowled at the opening port, his broken arm sticking out stiffly before him in its cast. None of them mentioned the arm or looked in his direction, but he knew why they were laughing.

Jason did not feel sorry for the pilot. Meta always gave fair warning to the men who made passes at her. Perhaps, in the romantically dim light of the bridge, he had not believed her. So she had broken his arm. Tough. Jason kept his face impassive as the man passed by him and out into the tubeway. This was constructed of transparent plastic, an undulating umbilical cord that connected the spacer to the transfer station, the massive, light-sprinkled bulk that loomed above them. Two other tubeways were visible, like theirs, connecting ships to this way station in space, balanced in a null-G orbit between the suns that made up the two star systems. The smaller companion, 70 Ophiuchi B, was just rising behind the station, a tiny disk over a billion miles distant.

"We've got a parcel here for the *Pugnacious*," a clerk said, floating out of the mouth of the tubeway. "A transshipment waiting your arrival." He extended a receipt book. "Want to sign for it?"

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Jason scrawled his name, then moved aside as two freight handlers maneuvered the bulky case down the tube and through the lock. He was trying to work a pinch bar under the metal sealing straps when Meta came up.

"What is that?" she asked, twisting the bar from his hands with an easy motion and jamming it deep under the strap. She heaved once and there was the sharp twang of fractured metal.

"You'll make some man a fine husband," Jason told her, dusting off his fingers. "I bet you can't do the other two that easily." She bent to the task. "This is a tool, something that we are going to need very much if we are going into the planet-busting business. I wish I had had one when I first came to Pyrrus, it might have saved a good number of lives."

Meta threw back the cover and looked at the ovoid, wheeled form. "What is it—a bomb?" she asked.

"Not on your life, this is something much more important." He tilted up the crate so that the object rolled out onto the floor.

It was an almost featureless, shiny metal egg that stood a good meter high with its small end up. Six rubber-tired wheels, three to a side, held it clear of the floor, and the top was crowned by a transparent-lidded control panel. Jason reached down and flipped up the lid, then punched a button marked *On* and the panel lights glowed.

"What are you?" he said.

"This is a library," a hollow, metallic voice answered.

"Of what possible use is that?" Meta said, turning to leave.

"I'll tell you," Jason said, putting out his hand to stop her, ready to move back quickly if she tried any arm-busting tricks. "This device is our intelligence, in the military sense not the IQ. Have you forgotten what we had to go through to find out anything at all about your planet's history? We needed facts to work from and we had none at all. Well we have some now." He patted the library's sleek side.

"What could this little toy possibly know that could help us?"

"This little toy, as you so quaintly put it, costs over nine hundred eighty-two thousand credits, plus shipping charges."

She was shocked. "Why—you could outfit an army for that much. Weapons, ammunition . . ."

"I thought that would impress you. And will you please get it through your exceedingly lovely blond head that armies aren't the solution to every problem? We are going to bang up against a new culture soon, on a new planet, and we want to open a mine in the right place. Your army will tell us nothing about mineralogy, or anthropology, or ecology, or exobiology or . . ."

"You are making those words up."

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"Don't you just wish I were. I don't think you quite realize how much of a library is stuffed into this creature's metal carcass. Library," he said, pointing to it dramatically, "tell us about yourself."

"This is a model 427-1587, Mark IX, improved, with photodigital laser-based recorder memory and integrated circuit technology . . ."

"Stop!" Jason ordered. "Library, you will have to do better than that. Can't you describe yourself in simple, newsfax language?"

"Well, hello there," the library chortled. "I'll bet you never saw a Mark IX before, the ultimate in library luxury . . ."

"We've hit the sales talk button, but at least we can understand it."

". . . And the very newest example of what the guys who built this machine like to call 'integrated circuit technology.' Well, friends, you don't need a galactic degree to understand that the Mark IX is something new in the universe. That 'integrated so-and-so' doubletalk just means that this is a thinking machine that can't be beat. But everyone needs something to think about as well as to think with, and just like the memory in your head, the Mark IX has a memory all its own. A memory that contains the *entire library* at the University of Haribay, holding more books than you could count in a lifetime. These books have been broken down into words and the words have been broken down into bits, and the bits have been recorded on little chips of silicon inside the Mark IX's brain. That memory part of the brain is no bigger than a man's clenched fist—a *small* man's fist—because there are over five hundred forty-five million bits to every ten square millimeters. You don't even have to know what a bit is to know that that is impressive. All of history, science and philosophy are in this brain—linguistics, too. If you want to know the word for *cheese* in the basic galactic languages, in the order of the number of speakers, it is this . . ."

As the high-speed roar of syllables poured out Jason turned to Meta—and found she was gone.

"It can do other things besides translate cheese," he said, pressing the *Off* button. "Just wait and see."

The Pyrrans were happy enough to vegetate, to doze and yawn, like tigers with full stomachs, during the trip to Felicity, and only Jason felt the urge to use the time efficiently. He searched all the cross-references in the library for information about the planet and the solar system it belonged to, and was only drawn from his studies by Meta's passionate, yet implacable, grasp. She felt that there were far more interesting ways to pass the long hours and Jason, once he had been severed from his labors, enthusiastically agreed with her.

One ship-day before they were scheduled to drop from jump-space

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into the Felicity system, Jason called a general meeting in the dining room.

"This is where we are going," he said, tapping a large diagram hung on the wall. There was absolute silence and one hundred percent attention since a military-style briefing was meat and drink to the Pyrrans.

"The planet is called Felicity, the fifth planet of a nameless class F1 star. This is a white star with about twice the luminosity of Pyrrus's own 2G sun and it puts out a lot more ultraviolet. You can look forward to getting nice suntans. The planet has nine-tenths of its surface covered by water, with a few chains of volcanic islands and only one land mass big enough to be called a continent. This one.

"As you can see it looks like a flattened out dagger, point downwards, divided roughly in the middle by the guard. The line here, represented by the guard, is an immense geological fault that cuts across the continent from one side to the other, an unbroken cliff that is three to ten kilometers high across the entire land mass. This cliff, and the range of mountains behind it, have had a drastic effect on the continental weather. The planet is far hotter than most other habitable ones, the temperature at the equator is close to the boiling point of water, and only this continent's location right up near the northern pole makes life bearable.

"Moist, warm air sweeps north and hits the escarpment and the mountains, where it condenses as rain on the southern slopes. A number of large rivers run south from the mountains and signs of agriculture and settlements were seen here —but were of no interest to the John Company men. The magnetometers and gravitometers didn't twitch a needle. But up here"—he tapped the northern half of the continent, the "handle" of the dagger—"the detectors went wild. The mountain building that pushed the northern half up so high, causing this continent-splitting range in the middle, stirred up the heavy metal deposits. Here is where the mines will have to be, in the middle of the most desolate piece of landscape I have ever heard about. There is little or no water, the mountain range stops most of it, and what does get past the mountains usually falls as snow on this giant, elevated plateau. It is frigid, high, dry, and deadly—and it never changes. Felicity has almost no axial tilt to speak of, so the seasonal changes are so slight they can scarcely be noticed. The weather in any spot remains the same all the time.

"To finish off this highly attractive picture of the ideal settlement site, there are men who live up here who are as deadly—or deadlier—than any life forms you ever faced on Pyrrus. Our job will be to sit right down in the middle of them, build a settlement and open a mine.

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Do I hear any suggestions as to how this can be done?"

"I know," Clon said, standing slowly. He was a hulking, burly man with a thick and protruding brow ridge. The weight of this bony ledge must have been balanced by even thicker bone in the skull behind, leaving room for only the most minuscule of brain cavities. His reflexes were excellent, undoubtedly short-circuited in his spinal column like some contemporary dinosaur, but any thoughts that had to penetrate his ossified cranium emerged only with the most immense difficulty. He was the last person Jason expected to answer.

"I know," Clon repeated. "We kill them all, then they don't bother us."

"Thanks for the suggestion," Jason said calmly. "Your chair's right behind you, that's it. Your suggestion is a sound Pyrran one, Pyrran also in the fact that you want to apply it to a second planet even though it failed on the first one. Attractive as it may look, we shall not indulge in genocide. We shall use our intelligence to solve this problem, not our teeth. We are trying to open this world up, not close it forever. What I propose is an open camp, the opposite of the armed lager the John Company men built. If we are careful, and watch the surrounding countryside carefully, we should not be taken by surprise. My hope is that we will be able to contact the locals and find out what they have against miners or off-worlders, and then try to change their minds. If anyone has a better suggestion for a plan of action, let me know now. Otherwise we land as close to the original site as we can and wait for contact. Our eyes are open, we know what happened to the first expedition, so we will be very careful that it doesn't happen to us."

Finding the original mine site was very easy. A year's slow growth of the sparse vegetation had not been enough to obscure the burnt scar on the landscape. The abandoned heavy equipment showed clearly on the magnetometer, and the *Pugnacious* sank to the ground close by. From above the rolling steppe had appeared to be empty of life, and it looked even more so once they were down.

Jason stood in the open air lock and shivered as the first blast of dry, frigid air hit him, the grass rustling to its passing, while grains of sand hissed against the metal of the hull. He had planned to be first out, but Rhes happened to knock against him as Kerk came up so that the gray-haired Pyrran slipped by and leaped to the ground.

"A light-eight planet," he said as he turned slowly, his eyes never still. "Can't be over 1G. Like floating after Pyrrus."

"It's closer to 1.5G," Jason said, following him out just as warily. "But anything is better than 2G."

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The first landing party, ten men in all, emerged from the ship and carefully surveyed the area. They stayed close enough to be able to call to one another, yet not so close that they blocked each other's vision, or field of fire. Their guns stayed in their power holsters and they walked slowly, apparently indifferent to the frigid wind and blown sand that reddened Jason's skin and made his eyes water. In their own, strictly Pyrran way, they were enjoying themselves after the forced relaxation of the voyage.

"Something moving two hundred meters to the southeast," Meta's voice spoke in their earphones. She was one of the observers at the viewports in the ship above.

They spun and crouched, ready for anything. The undulating plain still appeared to be empty, but there was a sudden hissing as an arrow arced towards Kerk's chest. His gun sprang into his hand and he shot it from the air as calmly and efficiently as he would have dispatched an attacking stingwing. Another arrow flashed towards them and Rhes stepped aside so that it missed him. They all waited, alert, to see what would happen next.

An attack, Jason thought, or is it just a diversion? It can't be possible —so soon after our arrival—that any kind of concerted attack could be launched. Yet, why not?

His gun jumped into his hand and he started to wheel about—just as hard pain slammed into his head. He had no awareness of falling, just a sudden and complete blackness.

IV

Jason did not enjoy being unconscious. A red, cloying pain engulfed him and, barely rational, he had the feeling that if he could only wake up all the way he could take care of everything. For some reason he could not understand his head was rocking back and forth, adding immeasurably to the agony, and he kept wishing it would stop, but it did not.

After what must have been a very long time he realized that when he was feeling the pain he must be conscious, or very close to it, and he should use these periods most advantageously. His arms were secured in some manner, he could feel that even if he could not see them, but they still had some degree of movement. The bulk of the power holster was there, pressed between his arm and his side, but the gun would not leap into his hand. His groping fingers eventually found out why, when they contacted the ragged end of the cable that connected the gun with the holster.

His shattered thoughts groped for understanding with the same disconnected numbness as had his fingers. Something had happened to him, someone not something, had hit him. Taken his gun away. What else? Why couldn't he see any-

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thing? Anything other than a diffuse redness when he tried to open his eyes. What else was gone? His equipment belt, surely, his fingers fumbled back and forth at his waist but could not find it.

They touched something. In its separate holder the medikit still remained on the back of his hip. Careful not to hit the release button —if it slipped out of his hand it was gone—he pressed the heel of his hand up against the device until his flesh contacted the actuating probe. The analyzer buzzed distantly and he never felt the stab of the hypodermic needles through the all-pervading agony in his head. Then the drug took effect and the pain began to seep away.

Without the overriding presence of the pain he could concentrate that small remaining part of his consciousness on the problem of his eyes. They could not be opened: something was sealing them shut. Something that might, or might not, be blood. Something that probably was blood considering the condition of his head, and he smiled at his success in completing this complicated line of thought.

Concentrate on one eye. Concentrate on right eye. Squeeze tight shut until it hurt, pull with lids to open. Squeeze shut again. It worked, the pulling, squeezing, tears-dissolving, and he felt the lids start to part stickily.

The white-burning sun shone directly into his eye and he had to blink and look away. He was moving backwards across the plains, a jarring and uneven ride, and there was something like a grid not too far from his face. The sun touched the horizon. It was important, he kept telling himself, to remember that the sun touched the horizon directly behind him, or perhaps a little bit to the right.

Right. Setting. A little to the right. The medikit's drugs and the traumatic shock were pushing him under again. But not yet. Setting. Behind. To the right.

When the last white glimmer dropped behind the horizon he closed the tortured eye and this time welcomed unconsciousness.

"–––––" a voice roared, an incomprehensible gout of sound. The sharp pain in his side made a far stronger impression and Jason rolled away from it, trying to scramble to his feet at the same time. Something hard and unyielding bruised his back and he dropped onto all fours. It was time to open his eyes, he decided, and he brushed at his sealed eyelids and managed to unglue them. One look convinced him that he had been far happier with them shut, but it was too late for that now.

The voice belonged to a big, burly man who clutched a two-meter long lance, with which he had been prodding Jason's ribs. When he saw that Jason was sitting up with his eyes open he pulled back the lance

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and leaned on it, examining his captive. Jason understood their relative positions when he realized that he was in a bell-shaped cage of iron bars, the top of which just cleared his head when he was sitting down. He leaned against the bars and studied his captor.

He was a warrior, that was clear, arrogant and self-assured, from the fanged animal skull that decorated the top of his padded helm to the needle-sharp prickspurs on the heels of his knee-high boots. A molded breastplate, apparently made of the same kind of material as his helm, covered the upper half of his body and was painted in garish designs around the central figure of an unidentifiable animal. In addition to the lance, the man had an efficient-looking short sword slung, unscabbard, through a thong on his belt. His skin was tanned and windburned, glistening with some oily substance and, standing upwind of Jason, he exuded a rich and unwashed, animal odor.

"–––––," the warrior shouted, shaking the lance at Jason.

"That's a pretty poor excuse for a language," Jason shouted back.

"–––––," the man answered, in a shriller voice this time, accompanied with sharp clicking sounds.

"And that one is not much better."

The man cleared his throat and spat in Jason's general direction. "*Bowab* you," he said, "you can speak the inbetween tongue?"

"Now that's more like it, a broken-down and corrupt form of standard English. Probably used as some sort of second language. I suppose that we'll never know who originally settled this planet, but one thing is certain—they spoke English. During the breakdown, when communication was cut off between all the planets, this fine world slipped down into dog-eat-dog barbarism and must have generated a lot of local dialects. But at least they kept the memory of English, debased though it is, as a common language between the tribes. It's just a matter of speaking it badly enough to be understood."

"What you say?" the warrior growled, shaking his head over Jason's incomprehensible burble of words.

Jason tapped his chest and said, "Sure me speak inbetween tongue just as good as you speak inbetween tongue."

This apparently satisfied the warrior because he turned and pushed his way through the throng. For the first time Jason had a chance to examine the passing men who had just been a blur in the background before. All males, and all warriors, dressed in numerous variations on a single theme. High boots, swords, half armor and helms, spears and short bows decorated in weird and colorful patterns. Beyond them, and on all sides, were rounded structures colored the same yellowish-gray as the sparse grass that cov-

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ered the plains. Something moved through the crowd, and the men gave way to a swaying beast and rider. Jason recognized the creature from the description given by the survivors of the massacre, of the mounts that had been ridden during the attack.

It was horselike in many ways, yet twice as big as any horse, and covered with shaggy fur. The creature's head had an equine appearance, but it was proportionately tiny and set at the end of a moderately long neck. It had long limbs, especially the forelegs which were decidedly longer than the hindlegs, so that its back sloped downwards from the withers to the rump, terminating in a tiny, flicking tail. The strong, thick toes on each foot had sharp claws that dug into the ground as the beast paced by, guided by the rider who sat just behind the forelimbs at the highest point on the humped back.

A harsh blast on a metallic horn drew Jason's attention and he turned to see a compact group of men striding towards his cage. Three soldiers with lowered lances led the way, followed by another with a dangling standard of some kind on a pole. Warriors with drawn swords walked alertly, surrounding the two central figures. One of them was the lance-jabber who had prodded Jason to life. The other, a head taller than his companions, had a golden helm and breastplate inset with jewels, while curling horns sprouted from both sides of his helm.

He had more than that, Jason saw when he approached the cage. The look of the hawk, or a great jungle cat secure in his rule. This man was the leader and he knew it, accepted it automatically. He, a warrior, leader of warriors. His right hand rested on the pommel of his bejeweled but efficient looking sword while he stroked the sweep of his great, red mustachios with the scarred knuckles of his left hand. He stopped close to the bars and stared in imperiously at Jason who tried, and failed, to return the other's gaze with the same intensity. His cramped position inside the cage and his battered, scruffy appearance did not help his morale.

"Grovel before Temuchin," one of the soldiers ordered, and buried the butt end of his lance in the pit of Jason's stomach.

It might have been easier to grovel but Jason, bent double with the pain, kept his head up and his eyes fixed on the other.

"Where are you from?" Temuchin asked, his voice so used to command that Jason found himself answering at once.

"From far away, a place you do not know."

"Another world?"

"Yes. Do you know about other worlds?"

"Only from the songs of the jongleurs. Until the first ship came

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down I did not think they were true. They are."

He snapped his fingers and one of the men handed him a blackened and twisted, recoilless rifle. "Can you make this spout fire again?" he asked.

"No." It must have been one of the weapons of the first expedition.

"What about this?" Temuchin held up Jason's own gun, its cable dangling where it had been torn from his power holster.

"I don't know." Jason was just as calm as the other. Let him just get his hands on the gun. "I will have to look at it closely."

"Burn this one, too," Temuchin said, throwing the gun aside. "Their weapons must be destroyed by fire. Now tell me at once, other world man, why do you come here?"

He'd make a good poker player, Jason thought. I can't read his cards and he knows all of mine. Then what should I tell him? Why not the truth?

"My people want to take metal from the ground," he said aloud. "We harm no one, we will even pay for . . ."

"No." There was a flat finality to the sound. Temuchin turned away.

"Wait, you haven't heard everything."

"It is enough," Temuchin said, halting for a moment and speaking over his shoulder. "You will dig and there will be buildings. Buildings make a city and there will be fences. The plains are always open." And then he added in the same, flat voice, "Kill him."

As the band of men turned to follow Temuchin the standard-bearer passed in front of the cage. His pole was topped with a human skull and Jason saw that the banner itself was made up of string after string of human thumbs, mummified and dry, knotted together on thongs.

"Wait!" Jason shouted at their retreating backs. "Let me explain. You can't just do this—"

But of course he could. A squad of soldiers surrounded the cage and one of them bent underneath it and there was the rattling of chains. Jason cowered back as the entire cage swung up on creaking hinges, and he clutched at the bars as the soldiers reached for him.

He sprang over them, kicking one in the face as he went by, and crashed into the soldiers beyond. The results were a foregone conclusion, but he made the most of the occasion. One soldier lay sprawled on the ground and another sat up holding his head when the rest carried Jason away. He cursed them, in six different languages, even though his words had as much effect on the stolid, expressionless men as had his blows.

"How far did you travel to reach this planet?" someone asked.

"Ekmortu!" Jason mumbled, spitting out blood and the chipped corner of a tooth.

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"What is your home world like? Much as this one? Hotter or colder?"

Jason, being carried face down, twisted his head around to look at his questioner, a gray-haired man in ragged leather garments that had once been dyed yellow and green. A tall, sleepy-eyed youth stumbled after him dressed in the same motley, though his were not as completely obscured by grime.

"You know so many things," the old man pleaded, "so you must tell me something."

The soldiers pushed the two men away before Jason could oblige by telling him some of the really pithy things that came to mind. With so many men holding him, he was completely helpless when they backed him against a thick iron pole set firmly in the ground and tore at his clothing. The metalcloth and fasteners resisted their fingers until one of them produced a dagger and sawed through the material, ignoring the fact that he was slicing Jason's skin at the same time. When his clothing had been pulled open to his waist Jason was bleeding from a dozen cuts and was groggy from the mauling he had taken. He was pushed to the ground and a leather rope lashed around his wrists—then the soldiers went away.

Although it was early afternoon the temperature must have been just above the freezing point. With his insulated clothing stripped away the shock of the cold air on his body brought him instantly to full, shivering consciousness.

What the next step would be was obvious. The strap that secured his wrists was a good three meters long and the other end was fastened to the top of the pole. He was alone in the center of a cleared area, and there was a bustle on all sides as the hump-backed riding beasts were saddled and mounted. The first man ready uttered a piercing, warbling cry and charged at Jason with his lance leveled. The beast ran with frightful speed, claws digging into the soil, hurtling forward like an unleashed thunderbolt.

Jason did the only thing possible, jumping to the other side of the pole and keeping it between himself and the attacking rider. The man jabbed with his lance but had to pull it back swiftly as he went by the pole.

Only fighting intuition saved Jason then, since the sound of the second beast's charge was lost in the thunder of the first. He grabbed the pole and spun around it. The lance clanged against the metal as the second attacker went by.

The first man was already turning his mount and Jason saw that a third had saddled up and was ready to attack. There could be only one possible outcome to this game of deadly target practice.

"Time to change the odds," he said, bending and groping in the top of his right boot. His combat knife was still there.

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As the third man started his charge Jason flipped the knife into the air and caught the hilt between his teeth, then sawed his leather bindings against its razor edge. They fell away and he crouched behind the slim pole to avoid the stabbing lance. The charge went by and Jason attacked.

He sprang, the knife in his left hand, reaching out with his right to grab the rider's leg in an attempt to unseat him. But the creature was moving too fast and he slammed into its flank behind the saddle, his fingers clutching at the beast's matted fur.

After that everything happened very fast. As the rider twisted about, trying to stab down and back at his attacker, Jason sank his dagger right up to its hilt in the animal's rump.

The needlelike spikes of the prickspurs that the warriors used in place of rowels on their spurs, indicated that the creatures they rode must not have very sensitive nervous systems. This was true of the thick hide and pelt over the ribs, but the spot that Jason's dagger hit, not too far below the animal's tail, appeared to be of a different nature altogether. A rippling shudder passed through the creature's flesh and it exploded forward as though a giant spring had been released in its guts.

Already off balance, the rider was tipped from his saddle and disappeared. Jason, clutching at the fur and worrying the knife deeper with his other hand, managed to hold on through one bound, then a second. There was the blurred vision of men and animals streaming by while Jason fought to keep his grip. This proved impossible and, on the third ground-shaking leap, he was tossed free.

Sailing headlong through the air, Jason saw he was aiming towards the space between two of the dome-shaped structures. This was certainly better than hitting one of them, so he relaxed and tucked his chin under as he struck the ground and did a shoulder roll, then another. Landing on his feet he kept running, his speed scarcely diminished.

The domed structures, dwellings of some kind, were scattered about with lanes in between them. He was in a wide, straight lane and thoughts of spearheads between the shoulder blades sent him darting off at right angles at the next opening. Outraged cries from behind him indicated that his pursuers did not think highly of his escape. So far he was ahead of the pack and he wondered how long he could keep it that way.

A leather flap was thrown back on one of the domes ahead and a gray-haired man looked out—the same one who had been trying to question Jason earlier. He appeared to take in the situation in a glance and, opening the flap wider, he motioned Jason towards it.

It was a time for quick decisions.

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Still running headlong, Jason glanced around and saw that, for the moment, no one else was in sight. Any port in a storm. He dived through the opening dragging the old man after him. For the first time he was aware that the combat knife was still in his hand, so he pressed it up through the other's beard until the point touched his throat.

"Give me away and you're dead," he hissed.

"Why should I betray you?" the man cackled. "I brought you here. I risk all for knowledge. Now back, while I close the opening." Ignoring the knife he began to lace the flap shut.

Looking quickly about the dark interior, Jason saw that the sleepy-eyed youth was dozing by a small fire, over which hung an iron pot. A withered crone was stirring something in the pot, completely ignoring the commotion at the entrance.

"In back, down," the man said, pushing at Jason. "They'll be here soon. They mustn't find you, oh no."

The shouting was coming closer outside and Jason could see no reason to find fault with the plan. "But the knife is still ready," he warned, as he sat against the back wall and allowed a collection of musty skins to be draped over his shoulders.

Heavy feet thundered by, shaking the earth, and voices could be heard from all sides now. Graybeard hung a leather shawl over Jason's head so that it obscured his face, then scrabbled in a pouch at his belt for a reeking clay pipe that he poked into Jason's mouth. Neither the old woman nor the youth paid any attention to all of this.

They still did not look up when a helmeted warrior tore open the entrance and poked his head inside.

Jason sat, motionless, looking out from under the leather hood, the hidden knife in his hand. Ready to dive across the floor and sink it into the intruder's throat.

Looking quickly about the dark interior, the intruder shouted what could only have been a question. Graybeard answered with a negative grunt—and that was all there was to it. The man vanished as quickly as he had come and the old woman tottered over to lace the entrance tightly shut again.

In his years of wandering about the galaxy Jason had encountered very little unselfish charity and was justifiably suspicious. The knife was still ready. "Why did you take the risk of helping me?" he asked.

"A jongleur will risk anything to learn new things," the man answered, settling himself cross-legged by the fire. "I am above the petty squabbles of the tribes. My name is Oraiel, and you will begin by telling me your name."

"Riverboat Sam," Jason said, putting the knife down long enough to pull up the top of his metalcloth suit and push his arms into it. He lied by reflex, like playing his cards close to his chest. There were no

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threatening moves. The old woman mumbled over the fire while the youth squatted behind Oraiel, sinking into the same position.

"What world are you from?"

"Heaven."

"Are there many worlds where men live?"

"At least thirty thousand, though no one can be completely sure of the exact number."

"What is your world like?"

Jason looked around, and for the first time since he had opened his eyes in the cage he had a moment to stop and think. Luck had been with him so far, but he was still a long way from getting out of this alive.

"What is your world like?" Oraiel repeated.

"What's your world like, old man? I'll trade you fact for fact."

Oraiel was silent for a moment and a spark of malice glinted in his half-closed eyes. Then he nodded. "It is agreed. I will answer your questions if you will answer mine."

"Fine. You'll answer mine first since I have more to lose if we're interrupted. But before we do this twenty questions business I have to take an inventory. Things have been too busy for this up until now."

Though his gun was gone, the power holster was still strapped into place. It was worthless now, but the batteries might come in useful. His equipment belt was gone and his pockets had been rifled. Only the fact that the medikit was slung to the rear had saved it from detection. He must have been lying on it when they searched him. His extra ammunition was gone as well as the case of grenades.

The radio was still there! In the darkness they must not have noticed it in the flat pocket almost under his arm. It only had line-of-sight operation, but that might be enough to get a fix on the ship, or even call for help.

He pulled it out and looked gloomily at the crushed case and the fractured components that were leaking from a crack in the side. Some time during the busy events of the last day it had been struck by something heavy. He switched it on and got exactly the result he expected. Nothing.

The fact that the chronometer concealed behind his belt buckle was still keeping perfect time did little to cheer him. It was ten in the morning. Wonderful. The watch had been adjusted for the twenty-hour day when they had landed on Felicity, with noon set for the sun at the zenith at the spot where they had landed.

"That's enough of that," he said, making himself as comfortable as was possible on the hard ground and pulling the furs around him. "Let's talk, Oraiel. Who is the boss here, the one who ordered my execution?"

"He is Temuchin the Warrior, The Fearless One, He of the Arm of Steel, The Destroyer . . ."

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"Fine. He's on top. I can tell that without the footnotes. What has he got against strangers—and buildings?"

"The Song of the Freemen," Oraiel said, digging his elbow into the ribs of his assistant. The youth grunted and rooted about in the tangled furs until he produced a lutelike instrument with a long neck and two strings. Plucking the strings for accompaniment he began to sing in a high-pitched voice.

"Free as the wind,
Free as the plain on which we wander,
Knowing no home,
Other than our tents. Our friends
The Moropes,
Who take us to battle,
Destroying the buildings,
Of those who would trap us."

There was more like this and it went on for an unconscionably long time, until Jason found himself beginning to nod. He interrupted, broke off the song, and asked some pertinent questions.

A picture of the realities of life on the plains of Felicity began to emerge.

From the oceans on the east and west, and from the Great Cliff in the south, to the mountains in the north there stood not one permanent building or settlement of man. Free and wild, the tribes roved over the grass sea, warring on themselves and each other in endless feuds and conflicts.

There had been cities here, some of them were even mentioned by name in the Songs, but now only their memory remained—and an uncompromising hatred. There must have been a long and bitter war between the two different ways of life, if the memory, generations later, could still arouse such strong emotions. With the limited natural resources of these arid plains the agrarians and the nomads could not possibly have lived side by side in peace. The farmers would have built settlements around the scant water sources and fenced out the nomads and their flocks. In self-defense the nomads would have had to band together in an attempt to destroy the settlements. They had succeeded so well in this genocidal warfare that the only trace of their former enemies that remained was a hated memory.

Crude, unlettered, violent, the barbarian conquerors roamed the high steppe in tribes and clans, constantly on the move as their stunted cattle and goats consumed the scant grass that covered the plains. Writing was unknown, the jongleurs—the only men who could pass freely from tribe to tribe—were the historians, entertainers and bearers of news. No trees grew in this hostile climate so wooden utensils and artifacts were unknown. Iron ore and coal were apparently plentiful in the northern mountains, so iron and mild steel were the most common materials used. These, along with

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animal hides, horns and bones, were almost the only raw materials available.

An outstanding exception were the helms and breastplates. While some were made of iron, the best ones came from a tribe in the distant hills who worked a mine of asbestoslike rock. They shredded this to fibers and mixed it with the gum of a broad-leafed plant to produce what amounted to an epoxy-fiberglass material. It was light as aluminum, strong as steel, and even more elastic than the best spring steel. This technique, undoubtedly inherited from the first, pre-breakdown settlers on the planet, was the only thing that physically distinguished the nomads from any other race of iron-age barbarians. Animal droppings were used for cooking fuel; animal fat for lamps. Life tended to be nasty, brutish and short.

Every clan or tribe had its traditional pasture ground over which it roamed, though the delimitations were vague and controversial, so that wars and feuds were a constant menace. The domed tents, *camachs*, were made of joined hides over iron poles. They were erected and struck in a few minutes, and when the tribe moved on they were carried, with the household goods, on wheeled frames called *escungs*, like a travois with wheels which were pulled by the *moropes*.

Unlike the cattle and goats, which were descendants of terrestrial animals, the *moropes* were natives of the high steppes of Felicity. These claw-toed herbivores had been domesticated and bred for centuries, while most of their wild herds had been exterminated. Their thick pelts protected them from the eternal cold, and they could go as long as twenty days without water. As beasts of burden—and chargers of war—they made existence possible in this barren land.

There was little more to tell. The tribes roved and fought, each speaking its own language or dialect and using the neutral inbetween tongue when they had to talk to outsiders. They formed alliances and treacherously broke them. Their occupation and love was war and they practiced it most efficiently.

Jason digested this information while he attempted, less successfully, to digest the unchewable lumps from the stew that he had forced himself to swallow. For drink there had been fermented *morope* milk, which had tasted almost as bad as it smelled. The only course he had missed was the one reserved for warriors, a mixture of milk and still-warm blood, and for this he was grateful.

Once Jason's curiosity had been satisfied, Oraiel's turn had come and he had asked questions, endlessly. Even while Jason ate he had had to mumble answers that the jongleur and his apprentice filed away in their capacious memories. They had

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not been disturbed, so he considered himself safe—for the time being. It was already late in the afternoon and he had to think of a way to escape and return to the ship. He waited until Oraiel ran out of breath then asked some pointed questions of his own.

"How many men are there in this camp?"

The jongleur had been sipping steadily at the *achadh*, the fermented milk, and was beginning to rock back and forth. He mumbled and spread his arms wide. "They are the sons of the vulture," he intoned. "Their numbers blacken the plain and the fearful sight of them strikes terror . . ."

"I didn't ask for a tribal history, just a nice round figure."

"Only the gods know. There may be a hundred, there may be a million . . ."

"How much is twenty and twenty?" Jason interrupted.

"I do not bother my thoughts with such stupid figurations."

"I didn't think you could do higher mathematics—like counting to one hundred and other exotic computations."

Jason went over and peered out of the opening between the laces. A blast of frigid air made his eyes water. High, icy clouds drifted across the pale blueness of the sky, while the shadows grew long.

"Drink," Oraiel said, waving the leathern bottle of *achadh*. "You are my guest and you must drink."

The silence was broken only by the rasp of sand as the old woman scrubbed out the cooking pot. The apprentice's chin was on his chest and he appeared to be asleep.

"I never refuse a drink," Jason said, and walked over and took the bottle.

As he raised it to his lips he saw the old woman glance up quickly, then bend low again over her work. There was a slight stirring behind him.

Jason hurled himself sideways, the drinking skin went flying and the club skinned his ear and crashed into his shoulder.

Still rolling, without looking, Jason kicked backwards and his foot caught the apprentice in the pit of the stomach. He folded nicely and the spiked iron bar rolled free of his limp hands.

Oraiel, no longer drunk, pulled a long, two-handed sword from under the furs beside him and swung on Jason. Though the spikes had missed, the bar itself had numbed Jason's right shoulder and his arm, which hung limply at his side. There was nothing wrong with his left arm, however, so he flung himself inside the arc of the sword before it could descend and locked his hand around the jongleur's throat, thumb and index finger on the major blood vessels. The man kicked spasmodically, then slumped unconscious.

Always aware of his flanks, Jason had been trying to keep one eye on the old woman, who now produced

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a gleaming, saw-edged knife—the *camach* was an armory of concealed weapons—and hopped to the attack. Jason dropped the jongleur and chopped her wrist so the knife fell at his feet.

The entire action had taken about ten seconds. Oraiel and his apprentice were draped over each other in an unconscious huddle, while the crone sobbed by the fire, cradling her wrist.

"Thanks for the hospitality," Jason said, trying to rub some life back into his numbed arm. When he could move his fingers again he tied and gagged the woman, then the others, arranging them in a neat row on the floor. Oraiel's eyes were open, radiating bloodshot waves of hatred.

"As ye sow, so shall ye reap," Jason said, picking over the furs. "That's another one you can memorize. I suppose you can't be blamed for trying to get your information, and the reward money as well. But you were being a little too greedy. I know that you're sorry now and want me to have enough of these moth-eaten furs to disguise myself with, as well as that greasy fur hat which has seen better days, and perhaps a weapon or two." Oraiel growled and frothed a little around his gag.

"Such language," Jason said. He pulled the hat low over his eyes and picked up the spiked club that he had wrapped in a length of leather. "Neither you nor the old girl have enough teeth for the job, but your assistant has a fine set of choppers. He can chew through the leather gag, then chew the thongs on your wrists. By which time I shall be far from here. Be thankful I'm not one of your own kind, or you would be dead right now." He picked up the skin of *achadh* and slung it from his shoulder. "I'll take this for the road."

There was no one in sight when he poked his head out of the *camach*, so he stopped long enough to lace the flap tightly behind him. He squinted up at the sky once, then turned away among the domed rows.

Head down, he shuffled away through the barbarian camp.

V

No one paid him the slightest attention.

Bundled as they were against the perpetual cold, most of the people looked as ragged and nondescript as he did, male or female, young and old. Only the warriors had any distinction of dress, and they could be easily avoided by scuttling off between the *camachs* whenever he saw one approaching. The rest of the citizenry avoided them as well, so no notice was taken of his actions.

There appeared to be no organized planning of the encampment that he could see. The *camachs* staggered in uneven rows, thrown up

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apparently wherever the owners had stopped. They thinned out after a while and Jason found himself skirting a herd of small, shaggy, and evil-looking cows. Armed guards, holding tethered *moropes,* were scattered about, so he made his way by as quickly as was prudent. He heard—and smelled—a flock of goats nearby, and avoided them as well. Then, suddenly, he was at the last *camach,* and the featureless plain was ahead, stretching out to the horizon. The sun was almost down and he squinted at it happily.

"Setting right behind me, or just a little to the right. I remember that much about the ride here. Now if I reverse the direction and march into the sunset I should come to the ship."

Sure, he thought, if I can make as good time as the thugs did who brought me here. And if I am going in the right direction, and they made no turns. And if none of these bloodthirsty types finds me. If—

Enough ifs. He shook his head and braced his shoulders, then took a swig of the foul *achadh.* As he raised the skin to his mouth he looked about him and saw that he was unobserved. Wiping his mouth on his sleeve, he strolled out into the empty steppe.

He did not go far. As soon as he found a gully that would shelter him from view of the encampment he dropped down into it. It gave him some protection from the wind and he pulled his knees up to his chest to conserve heat, then waited there until it was completely dark. It wasn't the most morale building way to spend the time, chilled and getting colder as the wind rustled the grass above his head, but there was no other way. He put a rock on the far wall of the gully, ready to mark the exact spot where the sun set, then huddled back against the opposite wall. He brooded about the radio, and even opened it to see if anything could be done, but it was unarguably beyond repair. After that he just sat and waited for the sun to reach the western horizon and for the stars to come out.

Jason wished that he had done some more stellar observation before the ship had landed, but it was a little late for that now. The constellations would be unfamiliar and he had no idea if there was a pole star or even a close circumpolar constellation that he could set his course by. One thing he did remember, from constant examining of the maps and charts as they prepared for the landing, was that they had set down almost exactly on the seventieth parallel, at seventy degrees of north latitude right on the head.

Now what did this mean? If there were a north polar star, it would be exactly seventy degrees above the northern horizon. Given a few nights, and a protractor, it would be easy enough to find. But his present situation did not allow much time for casual observation. Or the tem-

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perature either; he stamped his feet to see if they still had any sensation remaining in them.

The north polar axis would be seventy degrees above the northern horizon, which meant that the sun at noon would be exactly twenty degrees above the southern horizon. It had to be this way, every day of the year, since the axis of rotation of the planet was directly vertical to the plane of the ecliptic. No nonsense here about long days and short days—or even seasons for that matter. At any single spot on the planet's surface the sun always rose from the same place on the horizon. Day after day, year after year, it cut the identical arc across the sky, then set at the same spot on the western horizon as it had the night before. Day and night, all over the planet, were always of equal length. The angle of incidence of the sun's rays would always remain the same as well, which meant that the amount of radiation reaching any given area would remain constant the year round.

With days and nights of equal length, and the energy input always equal, the weather always remained the same and you were stuck with what you had. The tropics were always hot; the poles locked in a frigid and eternal embrace.

The sun was now a dim yellow disk that balanced on the sharp line of the horizon. At this high latitude, instead of dropping straight down out of sight, it slithered slantways along the horizon. When half the disk was obscured Jason marked the spot on the far rim, then went over and stood the pointed stone up at that spot. Then he returned to the spot where he had been sitting and squinted along his bearing marker.

"Very fine," he said out loud. "Now I know where the sun sets—but how do I follow that direction after dark? Think, Jason think, because right now your life depends upon it." He shivered, surely because of the cold.

"It would help if I knew just where on the horizon the sun set, how many degrees west of north. With no axial tilt the problem should be a simple one." He scratched arcs and angles in the sand and mumbled to himself. "If the axis is vertical every day must be an equinox, which means that day and night are equal every day which means . . . ho-ho!" He tried to snap his fingers, but they were too cold to respond.

"That's the answer! If the length of the night is to equal the length of the day, then there is only one place for the sun to set and rise, at every latitude from the equator north and south. The sun will have to cut a 180° arc through the sky, so it must rise due east and set due west. Eureka."

Jason put his right arm straight out from his shoulder and shuffled around until his finger was pointing exactly at his marker.

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"This is simplicity itself. I am pointing west and facing due south. Now I craftily pull up my left arm and I am pointing due east. All that remains now is to stand in this uncomfortable position until the stars come out."

In the high, thin air the first stars were already appearing in the east, though twilight still lingered on the opposite horizon. Jason thought for a moment and decided that he could improve upon the accuracy of the finger-pointing technique. He put a stone on the eastern rim of the gully, just above the spot where he had been sitting. Then he climbed the opposite wall and sighted at it over the first marker stone. A bright blue star lay close to the horizon in the correct spot, and a clear *Z* shaped constellation was beginning to be visible around it.

"My guiding star, I shall follow you from afar," Jason said, and snapped open his belt buckle to look down at the illuminated face of his watch. "Got you. With a twenty-hour day I can say ten hours of darkness and ten of light. So right now I walk directly away from my star. In five hours it will hit its zenith in the south, right on a line with my left shoulder as I walk. Then it swoops around and dives down to set directly in front of me about dawn. This is simplicity itself as long as I make adjustments for the new position every hour, or half hour, to allow for the changed position with the passage of time. Hah!"

Snorting this last he made sure that the *Z* was directly behind his back, shouldered his club, and tramped off in the correct direction. Everything seemed secure enough, but he wished, neither for the first nor the last time, that he had a gyrocompass.

The temperature dropped quickly as the night advanced, and in the clear, dry air the stars burned in distant, twinkling points. Overhead the constellations wheeled silently high, while the little *Z* hurried in its low arc until it stood at its zenith at midnight. Jason checked his watch, then dropped onto a crackling hummock of grass. He had been walking for over five hours with only a single break. In spite of his training at 2G on Pyrrus, the going was hard. He swigged from the drinking skin and wondered what the temperature was. In spite of its mildly alcoholic content the *achadh* was a half-frozen slush.

Felicity had no moons, but there was more than enough light to see by from the stars. The frigid grayness of the plain stretched away on all sides, silent and motionless except for the dark, moving mass coming up behind him.

Slowly, Jason sank to the ground, and lay there, frozen, while the *moropes* and their riders came near, the ground shivering with the rumble of their feet. They passed, no more than two hundred meters from where he lay, and he pressed

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flat and watched the dark, silent silhouettes until they vanished out of sight to the south.

"Looking for me?" he asked himself, standing and brushing at the furs. "Or are they heading for the ship?"

This latter seemed the most obvious answer. The compactness of the group and their hurried pace indicated some specific destination. And why not? He had been brought from the ship along this route, so it was perfectly understandable that others should follow it as well. He considered going over to attempt to follow their trail, but did not think too highly of the idea. There could be a good bit of traffic, back and forth towards the ship, and he did not feel like being caught on the barbarian highway by daylight.

When he stood up the wind had a chance to get at him, and a fit of shivering shook him with a giant hand. He was as rested as he was ever going to be, so he might as well press on before he froze to death. Slinging the drinking skin and picking up the club, he began walking again in the correct direction, parallelling the raiders' track.

Twice more, during that seemingly endless night, groups of raiders hurried by in the same direction, while Jason concealed himself against chance observation. Each time it was harder to get up and go on, but the cold ground was a good persuader. By the time the sky began to lighten in the east the 1.5 gravity had exacted its toll. It took an effort of will for Jason to put one foot in front of the other. His guiding constellation was on the horizon, fading in the spreading grayness of dawn, and he went on until it was gone.

It was time to stop. Only by promising himself that he would not walk after sunrise had he managed to keep going at all. He could guide himself easily enough by the sun during the day, but it would be too dangerous. A moving figure could easily be seen at great distances on these plains. And, since the ship was not yet in sight, there was a good deal more walking to be done. He would have to get some rest if he were to go on, and this was only possible during the day.

He half fell, half crawled into the next gully. There was a small overhanging ledge, on the northern side where the sun would strike all day, just the burrow for him. The ledge would keep the wind off him and shield him from sight from above. Pulling his legs up to his chest he tried to ignore the cold of the ground that struck through his furs and insulated clothing. While he was wondering if, chilled, uncomfortable, exhausted, stifling, he could possibly fall asleep, he fell asleep.

Some sound, some presence bothered him, and he opened one eye and peered out from under the edge of the hat. Two gray-furred animals, with skinny tails and long teeth,

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were surveying him with wide eyes from the other side of the gully. He said *boo* and they vanished. The sun felt almost warm now and the ground had either warmed up or his side was too numb to feel anything. He went to sleep again.

The next time he awoke the sun had dropped behind the gully wall and he was in shadow. He knew just what a slab of meat in a frozen food locker felt like. Moving took almost more effort than he cared to make, and he was afraid that if he struck his hands or feet against anything they would crack off. There was still some *achadh* left in the skin and he swilled it down, which brought on an extended coughing fit. When it was over he felt weaker, though a little bit more alive.

Once again he took his direction from the setting sun, and when the stars came out started on his way. Walking was much worse than it had been the preceding night. Exertion, his wounds, the lack of food and the heightened gravity exacted their toll. Within an hour he was tottering like an octogenarian and knew that he could not go on like this. He dropped to the ground, panting with exhaustion, and pressed the release that dropped the medikit into his hand.

"I've been saving you for the last round. And, if I am not mistaken, I have just heard the final bell ringing."

Cackling feebly at this insipid witticism he adjusted the control dial for *stimulants, normal strength*. He pressed the actuator to the inside of his wrist and felt the sharp bite of the needles striking home.

It worked. Within sixty seconds he became aware that his fatigue was beginning to slip away, masked behind a curtain of drugs. When he stood he experienced a certain numbness in his limbs, but no tiredness at all.

"Onward!" he shouted, marking his guiding constellation as he slipped the medikit back into its holder.

The night was neither long nor short, it just passed in a pleasant haze. Under the stress of the drugs his mind worked well and he tried not to think of the physical toll they were exacting. A number of war parties passed, all coming from the direction of the ship, and he hid each time even though most of them were far distant. He wondered if some battle had been fought and if they might have been beaten. Each time he changed his course slightly to come closer to their line of march, so that there would be no chance of his getting lost.

Soon after three in the morning Jason found himself stumbling, and at one point actually trying to walk along on his knees. A full turn of the medikit control set it for *stimulants, emergency strength*. The injections worked and he went on again at the same regular pace.

It was almost dawn when he be-

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gan to smell the first traces of some burnt odor—that grew stronger with each pace forward. When the sky began to gray in the east the smell was sharp in his nostrils, and he wondered what significance it might have. Unlike the previous morning, he did not stop but pressed on. This was the last day that he had and he must reach the ship before the stimulants wore off. It could not be too far ahead. He would just have to stay alert and chance walking during the day. He was much smaller than the *moropes* and their riders and, given any luck at all, he should be able to spot them first.

When he walked into the blackened area of grass he would not believe it. A fire perhaps, accidentally ignited. It had burnt in an exact, circular pattern.

Only when he recognized the rusted and destroyed forms of the mining machinery did he dare admit the truth.

"I'm here. Back at the same spot. This is where we landed."

He staggered crazily in a circle, looking at the massive emptiness stretching away on all sides.

"This is it!" he shouted. "This is where the ship was, we put the *Pugnacious* down right here next to the original landing site. Only the ship isn't here. They've left—gone without me . . ."

Despair froze him and his arms dropped to his sides as he stood there, tottering, his strength gone. The ship, his friends, they were gone as well.

From close by came the rumble of heavy, running feet.

Over the hill rushed five *moropes,* their riders shouting with predatory glee as they lowered their lances for the kill.

VI

With conditioned reflex Jason swung up his arm, his hand crooked and ready for the fun—before he remembered that he had been disarmed.

"Then we'll do this the old-fashioned way," he shouted, swinging the iron club in a whistling circle. The odds were well against him, but before he went down they would know that they had been in a fight.

They came in a tight knot, each man trying to be first to the kill, jostling one another and leaning far forward with outstretched lances. Jason stood ready, legs wide, waiting for the last possible instant before he moved. The shrieking riders were at the edge of the burnt area.

A muffled explosion was followed instantly by a great, rolling cloud of vapor that hid the attackers from sight. Jason lowered his club and stepped back as a tendril of the cloud twisted towards him. Only one *morope* made it through the gray vapor, carried along by its momentum, skidding and collapsing with a ground-shaking thud. Its rider catapulted towards Jason and even

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managed to crawl a short distance farther, his jaw working with silent hatred, before he, too, collapsed.

When a wisp of the thinned-out gas reached Jason he sniffed, then moved quickly away. Narcogas, it worked instantly and thoroughly on any oxygen-breathing animal, producing paralysis and unconsciousness for about five hours. After which the victim recovered completely, with nothing worse than the nasty side effect of a skull-splitting headache.

What had happened? The ship had certainly gone, and there was no one else in sight. Fatigue was winning out over the effects of the stimulants and his thinking was getting muzzy. He heard the growing rumble for some seconds before he recognized the source of the sound. It was the rocket launch from the *Pugnacious*. Blinking up into the clear brightness of the morning sky he saw the high contrail stretching a white line across the sky towards him, growing larger with each passing second. The launch was first a black dot, then a growing shape, finally a flame-spouting cylinder that touched down less than a hundred meters away. The lock spun open and Meta dropped to the ground, even before the shock absorbers had damped the landing impact.

"Are you all right?" she called, running swiftly to him, the questing muzzle of her gun looking for enemies on all sides.

"Never felt better," he said, leaning on the club so he would not fall down. "What kept you? I thought you had all pulled out and forgotten about me."

"You know we wouldn't do that." She ran her hands over his arms, his back, while she talked. As though looking for broken bones—or simply reassuring herself of his presence. "We could not stop them from taking you away, although we tried. Some of them died. An attack was launched on the ship at the same time."

Jason could well understand the shock of battle and dogged resistance behind her matter-of-fact words. It must have been brutal.

"Come to the launch," she said, putting his arm across her shoulders so she could bear part of his weight. He did not protest. "They must have been concealed on all sides and reinforcements kept arriving. They are very good fighters and do not ask for quarter, nor do they expect it. Kerk soon realized that there would be no end to the battle and that we could not help you by staying there. If you did succeed in escaping—which he was sure you would if you were still alive—it would have been impossible for you to reach the ship. Therefore, under cover of counterattacks, we placed a number of spyeyes and microphones, as well as planting a good store of land mines and remote controlled gas bombs. After that we left, and the ship has set up a base somewhere in the northern mountains. I

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dropped off at the foothills with the launch and have been waiting ever since. I came as soon as I could. Here, into the cabin."

"You timed it very well, thank you. I can do that myself."

He couldn't, but he wouldn't admit it, and made believe that he had climbed the ladder instead of being boosted in by a powerful push from her feminine right arm.

Jason staggered over and dropped into the copilot's acceleration couch while Meta sealed the lock. Once it was closed the tension drained from her body as her gun whined back into its power holster. She hurried to his side, kneeling so she could look into his face.

"Take this filthy thing off," she said, hurling the fur cap to the floor. She ran her fingers through his hair and touched her fingertips lightly to the bruises and frostbite marks on his face. "I thought you were dead, Jason, really I did. I never thought I would see you again."

"Did that bother you so much?"

He was exhausted, his strength stretched well beyond the breaking point so that waves of blackness threatened to obscure his vision. He fought them away. He felt that, at this moment, he was closer to Meta than he had ever been before.

"It did, it bothered me. I don't know why." She kissed him suddenly, hard, forgetting the condition of his cracked and battered lips. He did not complain.

"Perhaps you are just used to having me around," he said, far more casually than he felt.

"No, it is not that. I have had men around before."

Oh, thanks, he thought.

"I have had two children. I am twenty-three years old. While piloting our ship I have been to many planets. I used to think that I knew all there was to know, but now I do not believe so. You have taught me many new things. When that man, Mikah Samon, kidnapped you I found out something I did not know about myself. I had to find you. These are very un-Pyrran things to feel, since we are taught to always think of the city first, never of other people. Now I am very mixed up. Am I wrong?"

"No," he said, fighting back the threat of overwhelming darkness. "Quite the opposite." He pressed his cracked and dirt-grimed fingers to the resilient warmth of her arm. "I think you are more right than any of the trigger-happy butchers in your tribe."

"You must tell me. Why do I feel this way?"

He tried to smile, but it hurt his face.

"Do you know what marriage is, Meta?"

"I have heard of it. A social custom on some planets. I do not know what it is."

An alarm buzzed angrily on the control board and she turned at once to it.

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"You still don't know, and maybe it's better that way. Maybe I'll never tell you." He smiled, his chin touched his chest and he fell instantly asleep.

"There are more of them coming," Meta said, switching off the alarm and glancing into the viewscreen. There was no answer. When she saw what had happened she quickly tightened the traps to secure him in the couch, then began the takeoff procedure. She neither noticed—nor cared—if any attackers were under the jets when she blasted skywards.

The pressure of deceleration woke Jason as they dropped down for the landing. "Thirsty," he said, smacking his dry lips together. "And hungry enough to eat one of those *moropes* raw."

"Teca is on the way," she told him, flipping off the switches as the launch grounded.

"If he is the same kind of sawbones his mentor, Brucco, is, he'll put me under for recovery therapy and keep me unconscious for a week. No can do." He turned his head, slowly, to look as the inner port opened. Teca, a brisk and authoritative young man, whose enthusiasm for medicine far exceeded his knowledge, climbed in.

"No can do," Jason repeated. "No recovery therapy. Glucose drip, vitamin injections, artificial kidney, whatever you wish as long as I'm conscious."

"That's what I like about Pyrrans," Jason said, as they carried him from the launch on a stretcher, the glucose drip bottle swinging next to his head. "They let you go to hell in your own way."

Meta saw to it that it took a good while for the leaders of the expedition to gather. Jason, whose eyes had closed in the middle of a grumbled complaint, spent the time in a deep, restorative sleep. He woke up when the hum of conversation began to fill the wardroom.

"Meeting will come to order," he said in what was intended to be a firm, commanding voice. It came out as a cracked whisper. He turned to Teca. "Before the meeting begins I would like some syrup for my throat and a shot to wake me up. Can you take care of that?"

"Of course I can," Teca said, opening his kit. "But I think it unwise due to the strain already imposed on your system." However he did not let his thoughts interfere with the swift execution of his duties.

"That's better," Jason said as the drugs once more wiped away the barrier of fatigue. He would pay for this—but later. The work must be done now.

"I've found out the answers to some of our questions," he told them. "Not all, but enough for a beginning. I know now that unless some profound changes are made we are not going to be able to establish a mining settlement. And

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when I say profound I mean it. We are going to have to change the complete mores, taboos and cultural motivations of these people before we can get our mine into operation."

"Impossible," Kerk said.

"Perhaps. But it is better than the only other alternative—which is genocide. As things stand now we would have to kill every one of those barbarians before we could be assured of establishing a settlement in peace."

A depressed silence followed this statement. The Pyrrans knew what this meant since they were themselves the unwilling genocidal victims of their home planet.

"We will not consider genocide," Kerk said, and the others unconsciously nodded their heads. "But your other alternative sounds too unreasonable . . ."

"Does it? You might recall that we are all here now because the mores, taboos and cultural motivations of your people have recently been turned upside down. What's good enough for you is good enough for them. We bore from within, utilizing those two ancient techniques known as 'divide and rule' and 'if you can't lick 'em—join 'em!' "

"It would help us," Rhes said, "if you explained what the mores exactly are that we are supposed to be disrupting."

"Didn't I tell you yet?" Jason searched his memory and realized that he hadn't. In spite of the drugs he was not thinking as clearly as he should. "Then let me explain. I have recently had an involuntary indoctrination into how the locals live. Nastily, is one word for it. They are broken up into tribes and clans, all of whom seem to be perpetually at war with the others. Occasionally two or more of the tribes will join together to wipe out one of the others whom they all agree needs wiping out. This is always done under the leadership of a warlord, someone smart enough to make an alliance and strong enough to keep it working.

"Temuchin is the name of the chief who organized the tribes to destroy the John Company expedition. He is so good at his job that, instead of breaking up the alliance when the threat was over, he kept it going and has even added to it. The anti-city taboo appears to be one of the strongest they have, so that it was easy to get recruits. He has kept his army busy ever since, consolidating more and more area under his control. When we arrived it gave his recruiting an even bigger boost. Temuchin is our main problem. We can get nowhere as long as he is leading the tribes. The first thing we must do is to take away his reason for this holy war, and we can do that easily enough by leaving."

"Are you sure that you are not feverish?" Meta asked.

"Thank you for the consideration, but I am fine. I mean we must con-

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vince the tribes that we have left. Another landing must be made on the same site and some sort of digging in got under way. Trouble will arrive quickly enough and we'll have to fight them off to prove that we mean business. At the same time we will try to talk to them through loudspeakers, apparently to convince them of our peaceful intent. We'll tell them all about the nice things we will give them if they let us alone. This will only make them fight harder. Then we will threaten to leave forever if they don't stop. They won't stop. So we blast off, straight up, and drop back to a hiding place in the mountains on a ballistic orbit so we won't be seen. That is stage one."

"I assume there is a stage two," Kerk said with marked lack of enthusiasm, "since up to now it looks very much like a retreat."

"That's just the idea. In stage two we find an isolated spot in the mountains that simply cannot be reached on foot. We build a model village there to which we transplant, entirely against their will, one of the smaller tribes. They will have all the most modern sanitary conveniences, hot water, the only flush toilets on the entire planet, good food and medical aid. They will hate us for it and do everything possible to kill us and to escape. We will release them —when this affair is over. But in the meanwhile we will utilize their *moropes* and *camachs* and the rest of their barbaric devices."

"What in the world for?" Meta asked.

"To form our own tribe, that's what for. The fighting Pyrrans. Tougher, nastier and more faithful to the taboos than any other tribe. We'll bore from within. We'll be so good at the barbarian game that our chief, Kerk the Great, will be able to squeeze Temuchin out of the top job. I know you will be able to get the operation rolling before I return."

"I did not know you were going," Kerk said, his baffled expression mirrored by the others. "What are you planning to do?"

Jason plucked an invisible string in midair. "I," he announced, "am going to become a jongleur. A wandering troubadour and spy, to sow dissent and prepare the way for your arrival."

VII

"If you laugh—or even smile—I'll break your arm," Meta said through tightly clenched teeth.

Jason had to use every iota of his gambler's facial control to maintain his bland, slightly bored expression. He knew she meant it about the broken arm. "I never laugh at a lady's new clothes," he said. "If I did, I would have split my sides many, many planets ago. I think you look fine for the job."

"You would," she hissed. "I think I look like some furry animal that has been run over by a ground car."

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"Look, Grif is here," he said, pointing. She automatically turned towards the door. It was a timely entrance because, now that she had mentioned it, she did look like . . .

"Well, Grif, come in my boy!" Making believe that the wide grin and hearty laugh were for the grim-faced nine-year-old.

"I don't like this," Grif said, flushed and angry. "I don't like looking funny. No one wears clothes like this."

"All three of us do," Jason said, aiming his remarks at the boy, but hoping they would register with Meta. "And where we are going it is the usual dress. Meta here is in the height of fashion among the plains tribes." She was wrapped in stained leather and furs, her angry face scowling out from under a shapeless hood. He looked quickly away. "While you and I wear the indifferent motley of a jongleur and his apprentice. You'll soon see how well we fit in."

Time to change the subject from their ludicrous apparel. He looked closely at Grif's face and hands, then at Meta's.

"The ultraviolet and the tanning drugs have worked fine," he said as he took a small leather bag from the sack at his waist. "Your skins are about the same color as the tribesmen's, but there is one thing missing. As protection against the cold and wind they grease their faces heavily. Wait, stop!" he said as both Pyrrans clenched their fists and death fluttered close. "I'm not asking you to smear on the rancid *morope* fat they use. This is clean, neutral, odorless, silicone jelly that will be good protection. Take my word for it—you'll need it."

Jason quickly dug out a glob and rubbed it onto his cheeks. Reluctantly, the other two did the same. Before they were finished the Pyrran scowls had deepened, which Jason had not thought possible. He wished they would relax—or this game would be over before it began. In the past week, once the others had approved, their plans had moved on teflon bearings. First the planned "retreat" from the planet, then the establishing of a base in this isolated valley. It was surrounded by vertical peaks on all sides, and completely inaccessible except by air.

Their resettlement camp was in the mountains nearby, a bit of plateau that was really only a large ledge set in a gigantic vertical cliff, a natural, escape-proof prison. It was already occupied by a clean and embittered family of nomads, five males and six females, that had been caught away from their tribe and quieted by narcogas. Their artifacts and clothes, suitably cleaned and deloused, had been turned over to Jason—as had their *moropes*. Everything was ready now to penetrate Temuchin's army, if Jason could only get these single-minded Pyrrans to cooperate.

"Let's go," Jason said. "It should be our turn by now."

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With its capacious holds and cabins, the *Pugnacious* was still being used as a base, though some of the prefabs were almost erected. As they went down the corridor towards the lock they met Teca coming in the opposite direction.

"Kerk sent me," he said. "They're almost ready for you."

Jason merely nodded and they started by him. Relieved of his message, Teca noticed for the first time their exotic garb and grease-covered faces. And the fierce scowls on the Pyrrans. It was all very much out of place in the metal and plastic corridor. Teca looked from one to the other, then pointed at Meta.

"Do you know what you look like?" he said, and made the very great mistake of smiling.

Meta turned towards him, snarling, but Grif was closer. Standing just next to the man. He sank his fist, with all of his weight, deep into Teca's midriff.

Grif was only nine—but he was a Pyrran nine-year-old. Teca had not expected the attack nor was he prepared for it. He said something like *whuf* as the air was driven from his chest, and sat down suddenly on the deck.

Jason waited for the mayhem to follow. Three Pyrrans fighting—and all of them angry! But Teca's mouth dropped open as he looked, wide-eyed, back and forth at the furry trio who surrounded him.

It was Meta who burst out laughing, and Grif followed an instant later. Jason joined in out of pure relief. Pyrrans rarely laugh, and when they do it is only at something broad and obvious, like a man being knocked suddenly onto his backside. It broke the tension and they roared until their eyes streamed, laughing even harder when the red-faced Teca climbed to his feet and stalked angrily away.

"What was all that about?" Kerk asked when they emerged into the frigid night air.

"You would never believe me if I told you," Jason said. "Is that the last one?"

He pointed to the unconscious *morope* that was being rolled into a heavy cable sling. The launch, with vertijets screaming, was hovering above them and lowering a line with a stout hook at the end.

"Yes, the other two have already been delivered, along with the goats. You go out in the next trip."

They looked on in silence while the hook was slipped through the rings in the net and the launch was waved away. It rose quickly, the legs of its unconscious burden dangling limply, and vanished into the darkness.

"What about the equipment?" Jason said.

"It has all been moved out. We set up the *camach* for you and put everything inside it. You three look impressive in those outfits. For the first time I think you may get away with this masquerade."

There were no hidden meanings

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in Kerk's words. Out here in the cold night, with a knifelike wind biting deep, their costumes were not out of place. They certainly were as effective as Kerk's insulated and electrically heated suit. Better perhaps. While his face was exposed, theirs were protected by the grease. Jason looked closely at Kerk's cheeks.

"You should go inside," he said, "or rub some of this grease on. You're getting frostbitten."

"Feels like it, too. If you don't need me here any more, I'll go and thaw out."

"Thanks for the help. We'll take it from here."

"Good luck then," Kerk said, shaking hands with all, including the boy. "We'll keep a full-time radio watch so you can contact us."

They waited, silently, until the launch returned. They boarded quickly and the trip to the plains did not take very long, which was all for the best, since the interior of the cabin felt stuffy and tropical after the night air.

When the launch had set them down and gone, Jason pointed to the rounded form of the *camach*. "Get inside and make yourselves at home," he said. "I'm going to make sure that the *moropes* are staked down so they don't wander away when they come to. You'll find an atomic power pack there, as well as a light and a heater to plug in. We might as well enjoy the benefits of civilization one last evening."

By the time he had finished with the beasts the *camach* had warmed up, and cheering light filtered through the lashings around the door flap. Jason laced it behind him and took off his heavy outer furs as the others had done. He rooted an iron pot from one of the hide boxes and filled it with water from a skin bag. This, and the other bags, had been lined with plastic which had not only leakproofed them, but made a marked difference in the quality of the water. He put it on the heater to boil. Meta and the boy sat, silently, watching every move he made.

"This is *char*," he said, breaking a crumbly black lump off of the larger brick. "It's made from one of the shrubs, the leaves are moistened and compressed into blocks. The taste is bearable and we had better get used to it." He dropped the fragments into the water which instantly turned a repellent shade of purple.

"I don't like the way it looks," Grif said, eyeing it suspiciously. "I don't think I want any."

"You better try it in spite of that. We are going to have to live just like these nomads if we are to escape detection. Which brings up another very important point."

Jason pulled his sleeve up as he spoke and began to unstrap his power holster—while the other two looked on with shocked, widened eyes.

"What is wrong? What are you

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doing?" Meta asked when he took the gun off and stowed it in the metal trunk. A Pyrran wears his gun every hour of the day and night. Life is unimaginable without one.

"I'm taking off my gun," he patiently explained. "If I used it, or if a tribesman even saw it, our disguise would be penetrated. I'm going to ask you to put yours in here, too."

There was a sharp ripping sound as both of the other guns tore through the leather clothing and slapped into their owners' hands. Jason looked calmly at the unwavering muzzles.

"That is exactly what I mean. As soon as you people get excited *zingo,* out come the guns. It's not that you can't be trusted, it's just that your reflexes are wrong. We're going to have to lock the guns away where we can get at them in an emergency, but where their presence can't betray us. We'll just have to handle the locals with their own weapons. Look here."

The guns zipped back into their power holsters as the Pyrrans' attention was captured by Jason's display. He unrolled a skin that clanked heavily. It was filled with a wicked assortment of knives, swords, clubs and maces.

"Nice, aren't they?" Jason asked, and they both nodded agreement. Candy and babies: Pyrrans and weapons. "With these we'll be just as well armed as anyone else—in fact better. Since any one Pyrran is better than any three barbarians. I hope. But we're shading the odds with these. With the exception of one or two items they are all copies of local artifacts, only made of much better steel, harder and with a more permanent edge. Now give me the guns."

Only Grif's gun appeared in his hand this time, and he had the intelligence to be a little chagrined as he let it slip back into the power holster. Fifteen solid minutes of wheedling and arguing reluctantly convinced Meta she should part with her weapon, and it took the two of them an hour more to disarm the boy. It was finally done and Jason poured out mugs of *char* for his unhappy partners—both of whom clutched swords to solace themselves.

"I know this stuff is terrible," he said, seeing the shocked expressions that appeared on their faces when they drank. "You don't have to learn to like it, but at least teach yourselves to drink it without looking as though you're being poisoned."

Except for occasional horrified looks at their bare right arms, the Pyrrans forgot the loss of guns while they readied the *camach* for the night. Jason unrolled the fur sleeping bags and turned off the heater while they packed the extra weapons away.

"Bedtime," he announced. "We have to get up at dawn to move to this spot on the chart. There is a small band of nomads going in the

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direction of what we think is Temuchin's main camp, and we want to meet them here. Join forces, practice our barbarian skills, and let them bring us into the camp without too much notice being taken of us."

Jason was up before dawn, and had all the off-planet devices sealed into the lockbox before he woke the others. He had left out three self-heating meal packs, but he would not let them be opened until the *escung* had been loaded. It was a clumsy, time-consuming job this first time, and he was relieved that his angry Pyrrans had been disarmed. The skin cover was pulled off the *camach* and the iron supporting poles were collapsed. These were tied onto the frame of the wheeled travois to act as a support for the rest of the luggage. The sun was well above the horizon and they were sweating, despite the lung-hurting chill air, before they were through loading everything aboard the *escung*. The *moropes* were rumbling deep in their chests while they grazed, while the goats were spread out on all sides nibbling the scant grass. Meta looked pointedly at all this eating and Jason got the hint.

"Come and get it," he said. "We can harness up after we eat." He pulled the opening tab on his pack and steam rose at once from its contents. They broke off the attached spoons and ate in hungry silence.

"Duty calls," Jason announced, scraping up the last morsel of meat. "Meta, use your knife and dig a nice deep hole to bury these meal packs. I'll saddle the *moropes* and harness the one that pulls the *escung*. Grif, take that basket, there on top, and pick up all the *morope* chips. We don't want to waste a natural resource."

"You want me to *what?*"

Jason smiled falsely and pointed to the ground near the big herbivores. "Dung. Those things there. We save them and dry them, and that is what we use from now on to heat and cook with." He swung the nearest saddle onto his back and made believe he did not hear the boy's answering remark.

They had observed how the nomads handled the big beasts and had had some practice themselves, but it was still difficult. The *moropes* were willing but incredibly stupid, and responded best only to the application of direct force. They were all almost exhausted by the time they moved out, Jason leading the way on one riding *morope* with Meta on the second. Grif, perched high on the loaded *escung*, trailed behind, riding backwards to keep an eye on the goats. These animals trailed after, grabbing mouthfuls of grass as they went, conditioned to stay close to their owners who supplied the vital water and salt.

By early afternoon they were saddle-sore and weary, when they saw the cloud of dust moving diagonally across their front.

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"Just sit quiet and keep your weapons handy," Jason said, "while I do the talking. Listen to the way they speak this simplified language so that later on you'll be able to do it yourself."

As they came closer the dark blobs of *moropes* could be made out, with the scattered specks of the goat herds behind. Three *moropes* swung away from the larger group and headed their way at a dead run. Jason held up his hand for his party to halt, then cursed as he threw all of his weight on the reins to bring his hulking mount to a stop. Sensation penetrated its tiny brain and it shuddered to a halt and began instantly to graze. He loosened his knife in its sheath and noticed that Meta's right hand was unconsciously flexing, reaching for the gun that was not there. The riders thundered up, stopping just before them.

The leader had a dirty, black beard and only one eye. The red, raw appearance of the empty socket suggested that the eyeball had been gouged out. He wore a dented metal helm that was crowned with the skull of some long-toothed rodent.

"Who are you, jong'eur?" he asked, shifting a spiked mace from hand to hand. "Where you go?"

"I am Jason, singer of songs, teller of tales, on my way to the camp of Temuchin. Who are you?"

The man grunted and picked at his teeth with one blackened nail.

"Shanin of the rat tribe. What do you say to rats?"

Jason had not the slightest idea what one said to rats, though he could think of a few possibly inappropriate remarks. He noticed now that the others had the same type of skull, rats' skulls undoubtedly mounted on their helms. The symbol of their tribe, perhaps, different skulls for different tribes. But he remembered that Oraiel had no such decoration, and that the jongleurs were supposed to stay outside of tribal conflicts.

"I say hello to rats," he improvised. "Some of my best friends are rats . . ."

"You fight feud with rats?"

"Never!" Jason answered, offended by the suggestion.

Shanin seemed satisfied, and went back to picking his teeth. "We go to Temuchin, too," he said indistinctly around his finger. "I have heard Temuchin strikes against the mountain weasels so we join him. You ride with us. Sing for me tonight."

"I hate mountain weasels, too. I'll sing tonight."

At a grunted command the three men wheeled and galloped away. That was all there was to it. Jason's party followed and slowly caught up with the moving column of *moropes*, swinging in behind them so that their herd of goats did not mix with the others.

"That's what all the goat leads are for," Jason said, coughing in the cloud of dust that hung heavy in the air. "As soon as we stop I want

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you two to secure all our animals so they can't get lost in the other herd."

"Aren't you planning to help?" Meta asked, coldly.

"Much as I would love to, this is a male-orientated, primitive society and that sort of thing just isn't done. I'll do my share of the work out of sight in the tent, but not in public."

It was a short day, which the disguised off-worlders appreciated, because the nomads reached their goal, a desert well, early in the afternoon. Jason, saddle-sore and stiff, slid to the ground and hobbled in small circles to work the circulation back into his numb legs. Meta, and Grif, were rounding up and tethering the protesting goats, which induced Jason to take a walk around the camp to escape her daggerlike glances. The well interested him: he came to look and stayed to help. Only men and boys were gathered here since there seemed to be a sexual taboo connected with the water. This was understandable, since water was as essential to life as hunting ability in this semiarid desert.

A rock cairn marked the well, which the men removed to disclose a beaten iron cover. This was heavily greased to retard its rusting, though the covering rocks had cut through the grease and streaks of oxidation were beginning to form. When the cover had been lifted aside, one of the men thoroughly greased it again on both sides. The well itself was about a meter in diameter and impressively deep, lined with stones so perfectly cut and set that they locked into place without mortar. They were ancient and much worn about the mouth, grooved by centuries of use. Jason wondered who the original builders had been.

Getting the water out of the well was done in the most primitive way possible by dropping an iron bucket down the shaft, then pulling it up again with a braided leather rope. Only one man at a time could work at this, straddling the well head and pulling the rope up hand over hand. It was tiring work and the men changed position often, standing about to talk or to bring the filled waterskins back to their *camachs*. Jason took his turn at the well, then wandered back to see how the work was coming.

All the goats had been tethered, and Meta and Grif had the iron *camach* frame erected while they struggled to drag the cover into place. Jason contributed his mite by hauling their lockbox from the pile of gear and sitting on it. Its tattered leather cover disguised the alloy container inside, secured with a lock that could only be opened by the fingerprint of one of the three of them. He plucked at the two-stringed lute, that he had made in frank imitation of the one he had seen the jongleur use, and hummed a song to himself. A passing tribesman stopped and watched the *camach* being erected. Jason recognized the man as one of the riders who had intercepted them earlier

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and decided to take no notice of him. He plinked out a version of a spaceman's drinking song.

"Good strong woman, but stupid. Can't put up a *camach* right," the tribesman said suddenly, pointing with his thumb.

Jason had no idea what he should say, so he settled for a grunt. The man persisted, scratching in his beard while he admired Meta.

"I need a strong woman. I'll give you six goats for this one."

Jason saw that it was more than her strength that the man admired. Meta, working hard, had taken off her heavy outer furs, and her slim figure was far more attractive than the squat and solid ones of the nomad women. Her hair was neat, her teeth unbroken, her face unmarked or scarred.

"You wouldn't want her," Jason said. "She sleeps late, eats too much. Costs too much. I paid twelve goats for her."

"I'll give you ten," the warrior said, walking over and grabbing Meta by the arm and pulling her about so he could look at her.

Jason shuddered. Perhaps the tribeswomen were used to being treated like chattels, but Meta certainly wasn't. Jason waited for the explosion, but she surprised him by pulling her arm away and turning back to her work.

"Come here," Jason told the man. He had to break this up before it went too far. "Come have a drink, I have good *achadh*."

It was too late. The warrior shouted in anger at being resisted by a mere woman and, with his bunched fist, struck her over the ear, then reached to pull her about again.

Meta stumbled from the force of the unexpected blow and shook her head. When he pulled at her this time she did not resist but spun about, bringing up her arm at the same time. The stiffened outer edge of her hand caught him across the larynx, almost fracturing it, rendering him voiceless. She stood, ready now, while the man doubled over, coughing hoarsely and spitting up blood.

Jason tried to spring forward, but it was over before he had taken a single pace.

The warrior's fighting reflexes were good—but Meta's were even better. He came out of the crouch, blood streaming down his chin, with a knife in his hand, swinging it up underhand in a wicked knife-fighter's thrust.

Meta clutched his wrist with both her hands, twisting at the same instant so that the knife went by her. She continued to twist, levering the man's arm up behind his back, exerting bone-breaking pressure so that the knife dropped from his powerless fingers. She could have left it at this, but because she was a Pyrran she did not.

She caught the knife before it touched the ground, straightened

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and brought it slanting up into the man's back, below and inside his rib cage, sinking it to the hilt so the blade penetrated his lung and heart, killing him instantly. When she released him he sank, unmoving, to the ground.

Jason sank back onto the lockbox and, as though by chance, his forefinger touched the keying plate and he felt the click as the bolt unlatched. A number of onlookers had watched the encounter and a hum of astonishment filled the air. One woman waddled over and picked up the man's arm, which dropped limply when she released it. "Dead!" she said in an astonished voice and looked, wonderingly, at Meta.

"You two—over here!" Jason called out, using their own "tribal" tongue that the crowd would not understand. "Keep your weapons handy and stand close. If this really gets rough, there are gas grenades and your guns in here. But once we use them we'll have to wipe out or capture the entire tribe. So let's save that as a last resort."

Shanin, with a score of his warriors behind him, pushed through the crowd and looked unbelievingly at the dead man. "Your woman kill this man with his own knife?"

"She did—and it was his own fault. He pushed her around, started trouble, then attacked her. It was just self-defense. Ask anyone here." There was a mutter of agreement from the crowd.

The chief seemed more astonished than angry. He looked from the corpse to Meta, then swaggered over and took her by the chin, turning her head back and forth while he examined her. Jason could see her knuckles go white but she kept her control.

"What tribe she from?" Shanin asked.

"From far away, in the mountains, far north. Tribe called the . . . Pyrrans. Very tough fighters."

Shanin grunted. "I never heard of them." As though his encyclopedic knowledge ruled them out of existence. "What's their totem?"

What indeed, Jason thought? It couldn't be a rat, or a weasel. What kind of animals had they seen in the mountains? "Eagle," he announced, with more firmness than he felt. He had seen something that looked like an eagle once, circling the high peaks.

"Very strong totem," Shanin said, obviously impressed. He looked down at the dead man and stirred him with his foot. "He has a *morope*, some furs. Woman can't have them." He looked up shrewdly at Jason, waiting for an answer.

The answer to that one was easy. Women, being property themselves, could not own property. And to the victor went the spoils. Don't let anyone ever say that dinAlt was not generous with secondhand *moropes* and used furs.

"The property is yours, of course,

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Shanin. That is only right. I would never think of taking them, oh no! And I shall beat the woman tonight for doing this."

It was the right answer and Shanin accepted the booty as his due. He started away, then called back over his shoulder. "He could not have been a good fighter if a woman killed him. But he has two brothers."

That meant something all right, and Jason gave it some thought as the people in the crowd dispersed, taking the dead man with them. Meta and Grif finished erecting the cover on the *camach* and carried all of their goods inside. Jason dragged in the lockbox himself, then sent Grif to tether the goats closer in, near their *moropes*. The killing could lead to trouble.

It did, and faster than Jason had imagined. There were some thuds and a shrill scream outside and he raced for the entrance. Most of the action was over by the time he reached it.

A half dozen boys, relatives perhaps of the dead man, had decided to exact a little revenge by attacking Grif. Most of them were older or bigger than he, so they must have planned on a quick attack, a beating, and a hasty retreat. It did not work out quite as they had originally planned.

Three boys had grabbed him, to hold him securely while the others administered the drubbing. Two of these now lay unconscious on the ground, since the Pyrran boy had cracked their skulls together, while the third rolled in agony after having been kneed in the groin. Grif was kneeling on the neck of the fourth boy while attempting to break the leg of the fifth by twisting it up behind his back. The sixth boy was trying to get away and Grif was reaching for his knife to stop him once and for all before he made his escape.

"Not the knife!" Jason shouted, and helped the survivor on his way with a good boot in the coccyx. "We're in enough trouble without another killing."

Scowling, deprived of his pleasure, Grif elicited both a shrill scream, with an extra ankle-twist, and a choked groan from under his grinding knee. Then he stood and watched while the survivors limped and crawled from the area of combat. Except for a rapidly blackening eye and a torn sleeve he was unhurt himself. Jason, speaking calmly, managed to get him inside the *camach* where Meta put a cold compress on his eye.

Jason laced up the entrance and looked at his two Pyrrans, their tempers still aroused, stalking around as though still looking for trouble.

"Well," he said, shrugging his shoulders, "no one can say that you don't make a strong first impression."

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VIII

Though they had, the swords of lightning
Die they did in countless numbers. Arrows flight
did speak to strangers,
bidding them to leave our pastures . . .

"I speak with the voice of Temuchin, for I am Ahankk his captain," the warrior said, throwing open the entrance to Shanin's *camach*.

Jason broke off his "Ballad of the Flying Strangers," and turned slowly to see who had caused the welcome interruption. His throat was getting sore and he was tired of singing the same song over and over. His account of the spaceship's defeat was the pop hit of the encampment.

The newcomer was a high-ranking officer, that was obvious. His breastplate and helm were shiny and undented, and even set with a few roughly cut jewels. He swaggered as he walked, planting his feet squarely as he stood before Shanin, his hand resting on his sword pommel.

"What does Temuchin want?" Shanin asked coldly, his hand on his own sword, not liking the newcomer's manner.

"He will hear the jongleur who is called Jason. He is to come at once."

Shanin's eyes narrowed to cold slits. "He sings for me now, when he is through he will come to Temuchin. Finish the song," he said turning to Jason.

To a nomad chief all chiefs are equal and it is hard to convince them differently. Temuchin and his officers had plenty of experience and knew all the persuasive arguments. Ahankk whistled shrilly and a squad of heavily armed soldiers with drawn bows pushed into the *camach*. Shanin was convinced.

"I am bored with this croaking," he announced, yawning and turning away. "I will now drink *achadh* with one of my women. All leave."

Jason went out with his honor guard and turned towards his *camach*. The officer stopped him with a broad hand against his chest. "Temuchin will hear you now. Turn that way."

"Take your hand from me," Jason said in a low voice that the nearby soldiers could not hear. "I go to put on my best jacket and to get a new string for this instrument because one of these is almost broken."

"Come now," Ahankk said loudly, leaving his hand where it was and giving Jason a shove.

"We will first visit my *camach*, it is just over there," Jason answered, just as loudly. At the same time he reached up and took hold of the man's thumb. This is a good grip at any time, and his 2G hardened muscles added the little extra something that made the thumb feel like it was being torn from the hand. The officer writhed and resisted,

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pulling at his sword clumsily, crosswise, since it was his sword hand that Jason was slowly rending.

"I'll kill you with this knife that is pushed against your middle if you draw your sword," Jason said, holding the lute under his arm and pressing the bone pick into Ahankk's stomach. "Temuchin said to bring me, not kill me. He will be angry if we fight. Now—which do you choose?"

The man struggled for another moment, lips drawn back in anger, then released his sword. "We shall go to your *camach* first so you can dress in something more fitting than those rags," he ordered aloud.

Jason let go of the thumb and started off, turned slightly sideways so he could watch the officer. The man walked beside him calmly enough, rubbing his injured thumb, but the look he directed at Jason was pure hatred. Jason shrugged and went on. He had made an enemy, that was certain, yet it was imperative that he go to the tent.

The trek with Shanin and his tribe had been exhausting but uneventful. There had been no more trouble from the relatives of the slain man. Jason had utilized the time well to practice his jongleur's art and to observe the customs and culture of the nomads. They had reached Temuchin's camp and settled in over a week ago.

"Camp" was not an apt description, because the nomads were spread out for miles along the polluted, refuse laden stream they called a river. The biggest river, apparently, in the entire land. Since the animals had to compete for the scant forage, a good deal of territory was needed for each tribe. There was a purely military camp in the center of all these settlements but Jason had not yet been near it. Nor was he in a hurry to. There was enough for him to observe and record on the outskirts before he would be sure enough of himself to penetrate to the heart of the enemy. In addition to the fact that Temuchin had once seen him, face to face, and he appeared to be the kind of man who would have a good memory. Jason's skin was darker now, and he had used a pileating agent to hurry the growth of a thick and sinister moustache that hung almost to his chin on both sides of his mouth. Teca had inserted plugs that changed the shape of his nose. He hoped it would be enough. Yet he wondered how the war chief had heard—and what he had heard—about him.

"Rise, awake," he shouted throwing open the flap of his *camach*. "I shall go before the great Temuchin and I must dress accordingly." Meta and Grif looked coldly at Jason and the officer who had followed him and made no attempt to move.

"Get cracking," Jason said in Pyrran. "Rush around and look like you're impressed, offer this elegant slob a drink and stuff like that. Keep his attention off me."

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Ahankk took a drink, but he still kept a wary eye on Jason.

"Here," Jason said, holding the lute out to Grif. "Put a new string on this thing, or make believe you are changing it if you can't find one. And *don't* lose your temper when I shove you, it's just part of the act."

Grif scowled and growled, but otherwise reacted well enough when Jason bullied him off to work with the lute. Jason shed his jacket, rubbed fresh grease into his face and a little onto his hair for good measure, then opened the lockbox. He reached in and took out his better jacket, palming a small object at the same time.

"Now hear this," he called out in Pyrran. "I'm being rushed to see Temuchin and there is no way out of it. I've taken one of the dentiphones and I've left two more on top. Put them on as soon as I've gone. Stay in touch and stay alert. I don't know how the interview is going to turn out, but if there is any trouble I want us to be in contact at all times. We may have to move fast. Stick with it, gang, and don't despair. We'll lick them yet."

As he slipped into the jacket he screamed at them in inbetween. "Give me the lute—and hurry! If anything is disturbed or there is any trouble while I am gone, I will beat you both." He stalked out.

They rode in a loose formation, and perhaps it was only accidental that there were soldiers on all sides of Jason. Perhaps. What had Temuchin heard and why did he want to see him? Speculation was useless and he tried to drop the train of thought and observe his surroundings, but it kept creeping back.

The afternoon sun was low behind the *camachs* when they approached the military camp. The herds were gone and the tents were arranged in neat rows. There were troops on all sides. A wide avenue opened up with a very large, black *camach* at the far end, guarded outside by a row of spearmen. Jason did not need any diagrams to know whose tent this was. He slid from his *morope*, tucked the lute under his arm, and followed his guiding officer with what he intended to be a proud but not haughty gait. Ahankk went in front of Jason to announce him, and as soon as his back was turned Jason slipped the dentiphone into his mouth and pushed it into place with his tongue. It fitted neatly over his upper back molar, and the power would be turned on automatically by contact with his saliva. *"Testing, testing, can you hear me?"* he whispered under his breath. The microminiaturized device had an automatic volume control and broadcast anything from a whisper to a shout.

"Loud and clear," Meta's voice rustled in his ear, inaudible to anyone but him. The output was fed as mechanical vibration into his tooth, thence to his skull and ear by bone conduction.

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"Step forward," Ahankk shouted, rudely jerking Jason from his radiophonic communication by grabbing his arm. Jason ignored him, pulling away and walking alone towards the man in the high-backed chair. Temuchin had his head turned as he talked to two of his officers, which was for the best, since Jason could not control a look of astonishment as he realized what the throne was made of. It was a tractor's seat, supported and backed by bound together, recoilless rifles. These were slung with leathern strings of desiccated thumbs, some of them just bone with a few black particles of flesh adhering. Temuchin, slayer of the invaders—and here was the proof.

Temuchin turned as Jason came close, fixing him with a cold, expressionless gaze. Jason bowed, more to escape those eyes than from any obsequious desires. Would Temuchin recognize him? Suddenly the nose plugs and drooping moustache seemed to him the flimsiest excuse for a disguise. He should have done better. Temuchin had stood this close to him once before. Surely he would recognize him. Jason straightened up slowly and found the man's chill eyes still fixed on him. Temuchin said nothing.

Jason knew he should stay quiet and let the other talk first. Or was that right? That is what he would do as Jason—attempt to outface and outpoint the other man. Stare him down and get the upper hand. But surely that was not to be expected of an itinerant jongleur? He must certainly feel a little ill at ease, no matter how snow-driven his conscience.

"You sent for me, great Temuchin. I am honored." He bowed again. "You will want me to sing for you."

"No," Temuchin said, coldly. Jason allowed his eyebrows to rise in mild astonishment.

"No songs? What then will the leader of men have from a poor wanderer?"

Temuchin swept him with his frigid glance. Jason wondered how much was real, how much shrewd rôle-playing to impress the locals.

"Information," Temuchin said just as the dentiphone hummed to life inside Jason's mouth and Meta's voice spoke. *"Jason—trouble. Armed men outside telling us to come out or they will kill us."*

"That is a jongleur's duty, to tell and teach. What would you know." Under his breath he whispered, "No guns! Fight them—I'll get help."

"What was that?" Temuchin asked, leaning forward threateningly. "What did you whisper."

"It was nothing, it was—" Damn, you couldn't say nervous habit in inbetween. "It is a jongleur's . . . way. Speaking the words of a song quietly, so they will not be forgotten."

Temuchin leaned back, a frown cutting deep lines in his forehead. He apparently did not think much

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of Jason's rehearsing during an audience. Neither did Jason. But how could he help Meta and Grif?

"Men—breaking in," her shouting voice whispered silently.

"Tell me about this Pyrran tribe," Temuchin said.

Jason was beginning to sweat. Temuchin must have a spy in the tribe, or Shanin had volunteered information. And the dead man's family seemed to be out for vengeance now, knowing he was away from the camp. "Pyrrans? They're just another tribe. Why do you want to know?"

"What?" Temuchin lunged to his feet pulling at his sword. "You dare to question me?"

"Jason—"

"Wait, no," Jason felt the perspiration beginning to form droplets under the layer of grease on his face. "I spoke wrong. Damn this inbetween tongue. I meant to say *what* do you want to know? I will tell you whatever I can."

"There are many of them. Swords and shields. They attack Grif, all together—"

"I have never heard of this tribe. Where do they keep their flocks?"

"The mountains . . . in the north, valleys, remote, you know—"

"Grif is down, I cannot fight them all—"

"What does that mean? What are you hiding? Perhaps you do not understand Temuchin's law. Rewards to those who are with me. Death to those who oppose me. The slow death for those who attempt to betray me."

"The slow death?" Jason said, listening for the words that did not come.

Temuchin was silent a moment. "You do not appear to know much, jongleur, and there is something about you that is not right. I will show you something that will encourage you to talk more freely." He clapped his hands and one of the attentive officers stepped forward. "Bring in Daei."

Was that a muffled breathing? Jason could not be sure. He brought his attention back to the *camach* and looked, astonished, at the man on the litter that was set down before them. The man was tied down by a tight noose about his neck. He did not try to loosen the rope and escape because there were just raw stumps where his fingers should have been. His bare, toeless feet had received the same treatment.

"The slow death," Temuchin said, staring fixedly at Jason. "Daei left me to fight with the weasel clans. Each day one joint is cut off each limb. He has been here many days. Now, today's justice." He raised his hand.

Soldiers held the man although he made no attempt to struggle. Thin strips of leather were sunk deep into the flesh of his wrists and ankles, and knotted tight. His right arm was pressed against the ground and one soldier made a swift chop

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with an ax. The hand jumped off, spurting blood. The men methodically went to the other arm, then the legs.

"He has two more days to go, as you can see," Temuchin said. "If he is strong enough to live that long, I may be merciful on the third day. I may be not. I have heard of one man who lived a year before reaching his last day."

"Very interesting," Jason said. "I have heard of the custom but it slipped my mind." He had to do something, quickly. He could hear the hammer of moropes' feet outside, and men's shouts. "Did you hear that? A whistle?"

"Have you gone mad?" Temuchin asked, annoyed. He waved angrily and the now unconscious man was carried out, the dismembered extremities kicked aside.

"It was a whistle," Jason said, starting towards the entrance. "I must step outside. I will return at once."

The officers in the tent, no less than Temuchin, were dumbfounded by this. Men did not leave his presence this way.

"Just a moment will do it."

"Stop!" Temuchin bellowed, but Jason was already at the entrance. The guard there barred his way, pulling out his sword. Jason gave him the shoulder, sending him spinning, and stepped outside.

The outer guards ignored him, unaware of what was happening inside. Walking casually but swiftly Jason turned right and had reached the corner of the large *camach* before his pursuers burst out behind him. There was a roar and the chase was on. Jason turned the corner and raced full tilt along the side.

Unlike the smaller circular *camachs* this one was rectangular, and Jason reached and dived around the next corner before the angry horde could see where he had gone. Shouts and hoarse cries echoed behind as he raced full tilt around the structure. Only when he reached the front again did he slow to a walk as he turned the last corner.

The pursuit was all streaming off in the opposite direction, bellowing distantly like hounds. The two guards who had been at the entrance were gone and all the other nearby ones were looking in the opposite direction. Walking steadily Jason came to the entrance and went inside. Temuchin, who was pacing angrily, was aware that someone had come in.

"Well," he shouted. "Did you catch . . . you!" He stepped back and drew his sword with a lightning slash.

"I am your loyal servant, Temuchin," Jason said flatly, folding his arms and not retreating. "I have come to report rebellion among your tribes."

Temuchin did not strike—nor did he lower his sword.

"Speak quickly. Your death is at hand."

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"I know you have forbidden private feuds among those who serve you. There are some who would slay my servant because she killed a man who attacked her. I have been near her ever since this happened—until today. Therefore, I asked a trusted man to watch and to report to me. I heard his whistle, because he dared not enter the *camach* of Temuchin. I have just talked to him. Armed men have attacked my *camach* in my absence and taken my servants. Yet I have heard that there is one law for all who follow Temuchin. I ask you now to declare about this."

There was the thud of feet behind Jason as his pursuers caught up and stormed through the entrance. They slid to a stop, piling up behind each other as they saw the two men facing each other—Temuchin with his sword still raised.

He glared at Jason, the sword quivering with the tension in his muscles. In the silence of the *camach* they could clearly hear his teeth grate together as he brought the sword down—point first into the dirt floor.

"Ahankk!" he shouted, and the officer ran forward slapping his chest. "Take four hands of men and go to the tribe of Shanin of the rat clan—"

"I can show you—" Jason interrupted.

Temuchin wheeled on him, thrust his face so close that Jason could feel his breath on his cheek, and said, "Speak once again without my permission and you are dead."

Jason nodded, nothing more. He knew he had almost overplayed his hand. After a moment Temuchin turned back to his officer.

"Ride at once to this Shanin and command him to take you to those who have taken the Pyrran servants. Bring all you find there here, as many alive as possible."

Ahankk saluted as he ran out: obedience counted before courtesy in Temuchin's horde.

Temuchin paced back and forth in a vile temper, and the officers and men withdrew silently, from the *camach* or back against its walls. Only Jason stood firm—even when the angry man stopped and shook his large fist just under Jason's nose.

"Why do I allow you to do this?" he said with cold fury. "Why?"

"May I answer?" Jason asked quietly.

"Speak!" Temuchin roared, hanging over him like a falling mountain.

"I left Temuchin's presence because it was the only way I could be sure that justice would be done. What enabled me to do this is a fact I have concealed from you."

Temuchin did not speak, though his eyes blazed with anger.

"Jongleurs know no tribe and wear no totem. This is the way it should be since they go from tribe to tribe and should bear no allegiance. But I must tell you that I

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was born in the Pyrran tribe. They made me leave and that is why I became a jongleur."

Temuchin would not ask the obvious question and Jason did not allow the expectant silence to become too long.

"I had to leave because—this is very hard to say—compared to the other Pyrrans . . . I was so weak and cowardly."

Temuchin swayed slightly and his face suffused with blood. He bent and his mouth opened—and he roared with laughter. Still laughing he went to his throne and dropped into it. None of the watchers knew what to make of this, therefore they were silent. Jason allowed himself the slightest smile but said nothing. Temuchin waved over the servant with a leathern blackjack of *achadh*, which he drained at a single swallow. The laughing died away to a chuckle, then to silence. He was his cold, controlled self once more.

"I enjoyed that," he said. "I find very little to laugh at. I think you are intelligent, perhaps too intelligent for your own good and you may someday have to die for that. Now you will tell me about your Pyrrans."

"We live in the mountain valleys to the north and rarely go down to the plains." Jason had been working on this cover story since he had first joined the nomads; now was the time to put it to the test. "We believe in the rule of might, but also the rule of law. Therefore, we seldom leave our valleys and we kill anyone who trespasses. We are the Pyrrans of the eagle totem, which is our strength, so that even one of our women can kill a plains warrior with her hands. We have heard that Temuchin is bringing law to the plains, so I was sent to find out if this were true. If it is true the Pyrrans will join Temuchin . . ."

They both looked up at the sudden interruption. Temuchin because there were shouts and commands as a group of *moropes* reined up outside the *camach*. Jason because a weak voice had very clearly said *Jason* . . . inside his head. He could not tell whether it was Meta or Grif.

Ahankk and his warriors came in through the entrance, half carrying, half pushing their prisoners. One wounded man, drenched with blood, and his unharmed companion, Jason recognized as two of the nomads from Shanin's tribe. Meta and Grif were brought in and dropped onto the ground, bloody, battered and unmoving. Grif opened his one uninjured eye and said "Jason," then slumped unconscious again. Jason started forward, then had enough self-control to halt, clenching his fists until his nails dug deep into his palms.

"Report," Temuchin ordered. Ahankk stepped forward.

"We did as you ordered, Temuchin. Rode fast to this tribe and the

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one Shanin took us to a *camach*. We entered and fought. None escaped, but we had to kill to subdue them. Two have been captured. The slaves breathe so I think they are alive."

Temuchin rubbed his jaw in obvious thought. Jason took a long chance and spoke.

"Do I have Temuchin's permission to ask a question?"

Temuchin gave him a long hard look, then nodded agreement.

"What is the penalty for rebellion and private vengeance in your horde?"

"Death. Is there any other punishment?"

"Then I would like to answer a question of yours that you asked earlier. You wanted to know what Pyrrans are like. I am the weakest of all the Pyrrans. I would like to kill the unwounded prisoner, with one hand, with a dagger alone, with one stroke—no matter how he is armed. Even with a sword. He looks to be a good warrior."

"He does," Temuchin said, looking at the big, burly man who was almost a head taller than Jason. "I think that will be a very good idea."

"Tie my hand," Jason ordered the nearest guard, placing his left arm behind his back. The prisoner was going to die in any case, and if his death could be put to a good use that would probably be more than the man had contributed to any decent cause in his entire lifetime. *Being a hypocrite, Jason?* a tiny inner voice asked, and he did not answer because there was a great deal of truth in the charge. At one time he had disliked death and violence and sought to evade it. Now he appeared to be actively seeking it.

Then he looked at Meta, unconscious and curled in pain upon the ground, and his knife whispered from its sheath. A demonstration of unusual fighting ability would interest Temuchin. And that ignorant barbarian with the hint of a smug smile badly needed killing.

Or he would be killed himself, if he hadn't planted the suggestion strongly enough. If they gave that brute a spear or a club, he would easily butcher Jason in a few minutes.

Jason did not change expression when the soldiers released the man and Ahankk handed him his own long, two-handed officer's sword. Good old Ahankk: it sometimes helped to make an enemy. The man still remembered the thumb-twisting and was getting his own back. Jason slapped his broad bladed knife against his side and let it hang straight down. It was an unusual knife that he had forged and tempered himself, after an ancient design called the bowie. It was as broad as his hand, with one edge sharpened the length of the blade, the other for less than half. It could cut up or down or could stab, and it weighed more than two kilos. And it was made of the best tool steel.

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The man with the sword shouted once and swung the sword high, running forward. One blow would do it, a swing with all of his weight behind it that no knife could possibly stop. Jason stood as calmly as he could and waited.

Only when the sword was swinging down did he move, stepping forward with his right foot and bracing his legs. He swung the knife up, with his arm held straight and his elbow locked, then took the force of the blow full on the edge of his knife. The strength of the swing almost knocked the knife from his hand and drove him to his knees. But there was a brittle clang as the mild steel struck the tool steel edge, all of the impact coming suddenly on this small area, and the sword snapped in two.

Jason had the barest glimpse of the shocked expression on his face as the man's arms swung down—his hands still locked tightly about the hilt that supported the merest stub of a blade. The force of the blow had knocked Jason's arm down and he moved with the motion, letting the knife swing down and around—and up.

The point tore through the leather clothing and struck the man low in the abdomen, penetrating to the hilt. Bracing himself, Jason jerked upward with all his strength, cutting a deep and hideous wound through the man's internal organs until the blade grated against the clavical in his chest. He held the knife there as the man's eyeballs rolled back into his head and Jason knew that he was dead.

Jason pulled the knife out and stepped back. The corpse slid to the floor at his feet.

"I will see that knife," Temuchin said.

"We have very good iron in our valley," Jason told him, bending to wipe the knife on the dead man's clothing. "It makes good steel." He flipped the knife in the air, catching it by the tip, then extended the hilt to Temuchin who examined it for a moment, then called to the soldiers.

"Hold the wounded one's neck out," he said.

The man struggled for a moment, then sank into the apathy of one already dead. Two soldiers held him while a third clutched his long hair with both hands and pulled him forward, face downward, with his dirt-lined neck bare and straight. Temuchin walked over, balancing the knife in his hand, then raised it straight over his head.

With a single, galvanic thrust of his muscles he swung the knife down against the neck and a meaty *chunnk* filled the silent *camach*.

The tension released, the soldier moved back a step, the severed head swinging from his fingers. The blood-spurting body was unceremoniously dropped to the ground.

"I like this knife," Temuchin said. "I will keep it."

"I was about to present it to you," Jason said, bowing to hide his

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scowl. He should have realized that this would happen. Well, it was just a knife.

"Do your people know much of the old science?" Temuchin asked, dropping the knife for a servant to pick up and clean. Jason was instantly on his guard.

"No more, or less, than other tribes," he said.

"None of them can make iron like this."

"It is an old secret, passed on from father to son."

"There could be other old secrets." His voice was as hard and cold as the steel itself.

"Perhaps."

"There is a lost secret then that you may have heard of. Some call it flamepowder and others gunpowder. What do you know of this?"

Indeed, what do I know of this? Jason thought, trying to read something from the other's fixed expression. What could a barbarian jongleur know of such things?

And if this was a trap what should Jason tell him?

TO BE CONTINUED

In Times to Come

Sometimes it's a bit difficult to tell you something about a coming story without telling you about the story—if you get what that somewhat self-negating statement implies.

Next month's featured novelette is "The Alien Rulers," by Piers Anthony; it's one of that you-can't-describe-it type stories. It's based on the proposition that an ideal government must be both benevolent and tyrannical—and that nothing generates more deep and abiding hatred than unassai'able benevolent tyrants. That hating the stern master who forces you to do what angers—but benefits!—you is productive of a soul-searing and self-frustrating anger unlike any other.

And most particularly so when the exact and overwhelmingly compelling reason the benevolent tyrants stay benevolent is brought home to you personally . . .

A sense of responsibility is a goad even more vicious than conscience. ■ THE EDITOR

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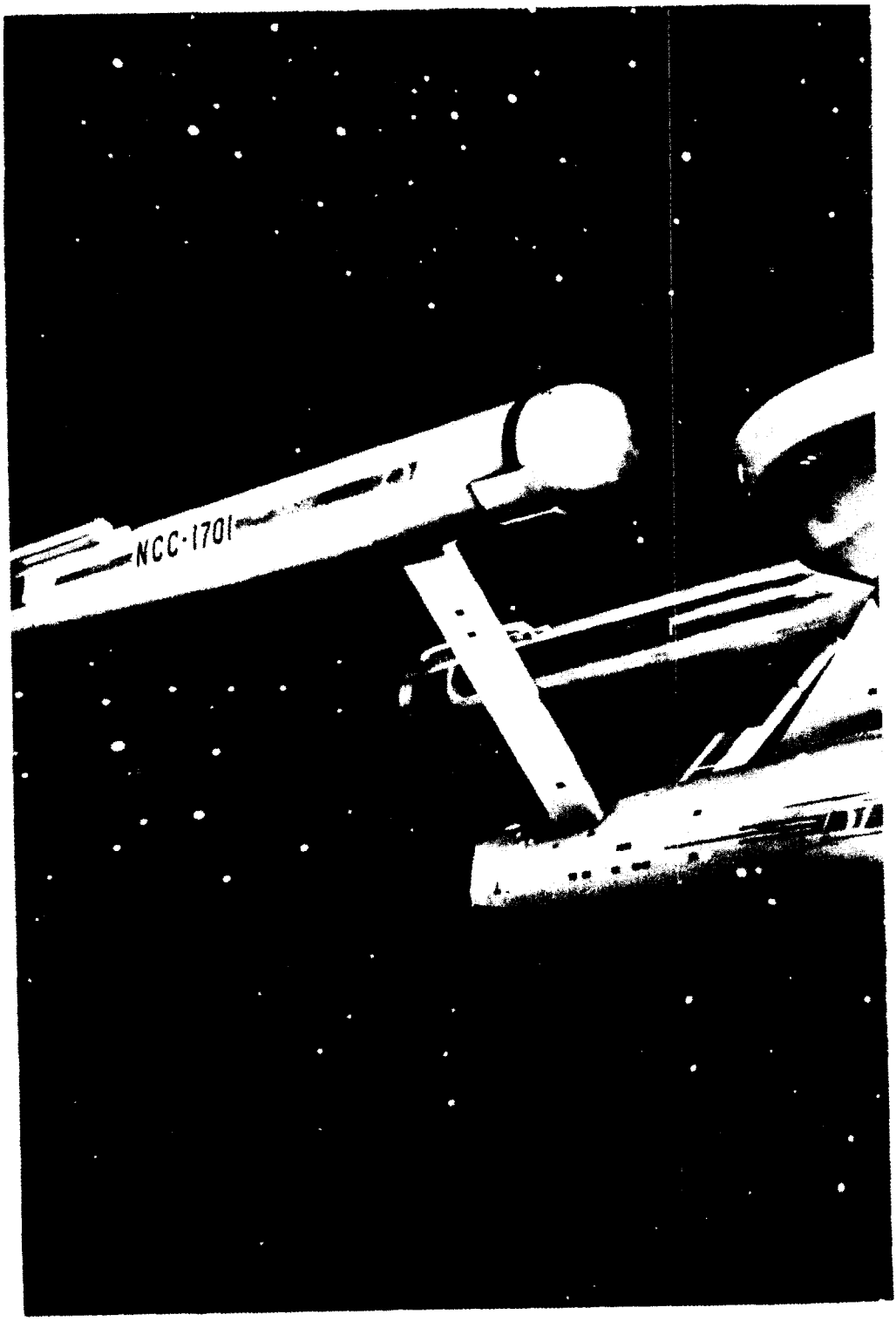

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To Make a "Star Trek" / G. Harry Stine

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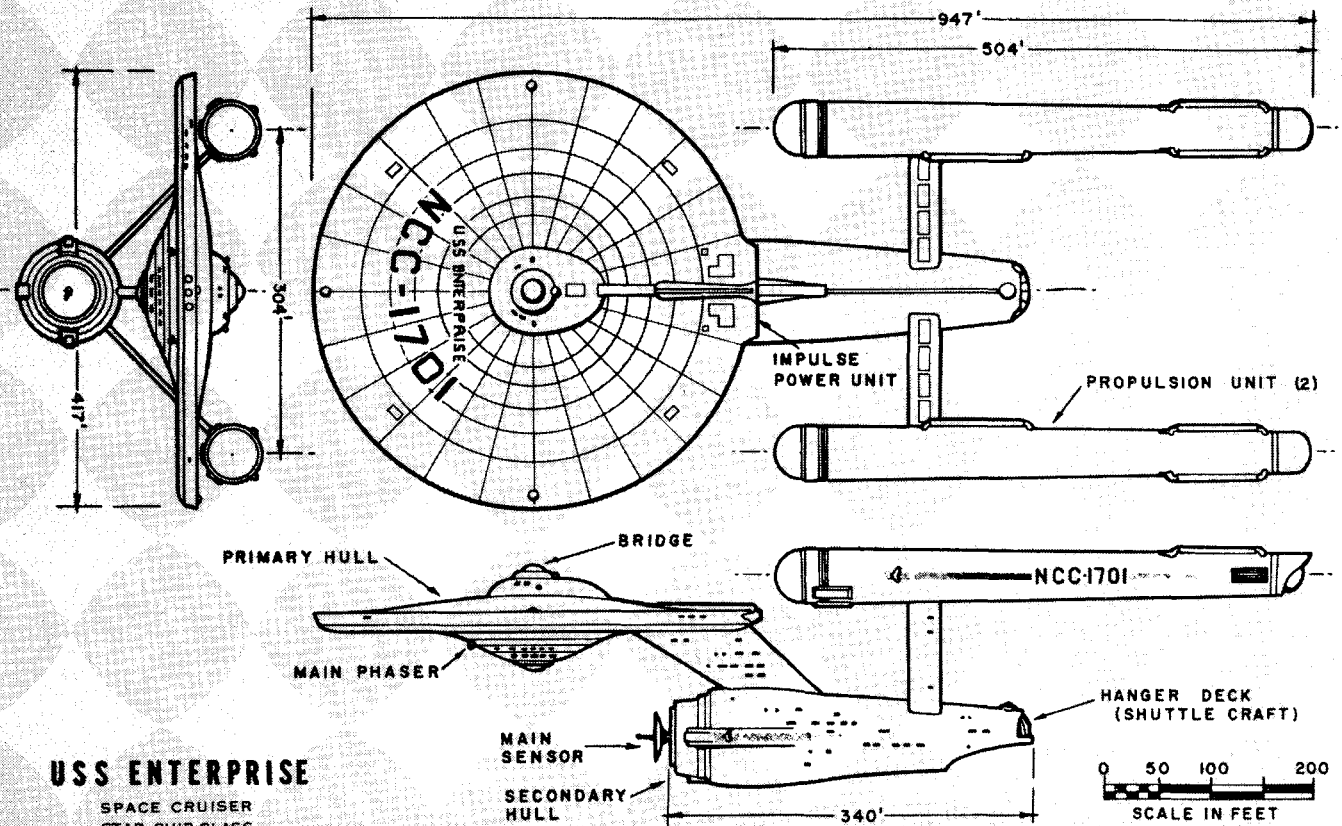

USS ENTERPRISE

SPACE CRUISER
STAR SHIP CLASS

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"Star Trek" is, of course, the first really adult, consistently high-level science-fiction show that's appeared on TV. And as all good science fiction must, it has an extensive, carefully worked out background of detail that never directly appears on the screen—yet is the reason "Star Trek" has the internal integrity it has. Did you know that the Enterprise *is nine hundred forty-seven feet long. . .? Built in orbit, and incapable of landing. . .?*

For over a year, a very strange thing has been happening.

Television is making a star trek, and the mission hasn't been cancelled.

In spite of the fact that most network television series shows appear to be intended for cloddies, and that science-fiction TV shows never seemed to get out of the old BEM era of early s-f, Gene Roddenberry and his staff at Desilu Studios managed to buck the all-knowing Overlords by dint of superhuman efforts and have created, produced, and made a thundering success of the NBC series, "Star Trek."

"Star Trek" is already a classic; its pilot film resides in the Smithsonian Institution.

Because "Star Trek" is real, honest, well-done, modern science fiction with no corners cut and no punches pulled, it has attracted the majority of science-fiction readers to the "tube." Among the Star Trekkers are also a very large number of scientists, engineers, lawyers, doctors, and other professional people. In common with good modern science fiction, "Star Trek" has a format in which many concepts and ideas can be handled that could not be brought forth otherwise; this, plus the fact that "Star Trek" is an adult adventure show, seems to be appreciated by enough people to keep the show's ratings high.

And "Star Trek" has captured a very important audience: The youngsters who are growing up in a technological world. Some astute observers seem to think that this is due to the imperturbable Mr. Spock who has admittedly and happily become the idol of teen-age girls because he is smart, never loses his cool, and presents a formidable challenge to female wiles. But I believe that something else is involved with the teen-agers' embracement of "Star Trek," and I have tested this myself in other ways by work-

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More interesting to the engineering type is what never appears on the program—the engineering drawings of the Enterprise.

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ing with today's youth: "Star Trek" paints an optimistic, challenging picture of the future; a belief in the utility of technology; a clarion call to the physical frontiers beyond the sky; and a philosophy that says mankind can and will prevail over his technological tools. "Star Trek" is to today's young generation what Buck Rogers and Flash Gordon were to their parents.

Another secret of the success of "Star Trek" is no secret to any science-fiction writer. Roddenberry and his staff have developed a highly detailed background for the show. Most of this never appears on the tube and is taken completely for granted by the characters. Occasionally, Kirk, "Bones" McCoy or Spock will discourse on science when such a discourse is absolutely essential to the story, but they never stop to explain phaser weapons, the transporter, warp factors, subspace radio, or any of the other common technology of the time period. And why should they? We don't think about the way a telephone works every time we use it, nor do we have to explain how a radio works every time we turn it on. The technology is there, and we use it; the crew of the U.S.S. *Enterprise* have technology, and they use it, too.

As a matter of fact, even if they did stop to explain it in detail, would we understand the technology of two hundred years hence? If we did, we could have it now! And it's akin to attempting to explain the operation of a laser to Benjamin Franklin using today's quantum mechanics terminology.

Just because all of the "Star Trek" background is not explained on the show does not mean that it has not been worked out in great detail by Roddenberry. To writers who wish to submit "Star Trek" scripts, Roddenberry sends a thirty-one-page document, "The Star Trek Guide." This explains in great detail the show's format, the biographical background of the major characters, and the technology and terminology of the series. I had trouble holding onto the Guide; my kids grabbed it away from me. But I did get to study it rather avidly and came to the conclusion that other persons might like to know some of this background information because it makes the series much more interesting.

The time period of "Star Trek" is about two hundred years hence. The technological forecasting is quite accurate, although many people might consider the "Star Trek" forecasts to be highly optimistic. (I don't.) Interstellar travel has long been achieved. It is a historical period of rapid human expansion to the stars. There are many well-established Terran colonies in existence. There are also numerous mining and manufacturing complexes operating on the outworlds. Contact has been made with a num-

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ber of extraterrestrial races, some of which are quite humanoid. For example, the Vulcanians from a planet circling 40 Eridani are so humanoid that a mating between Terran and Vulcanian can result in issue—namely Mr. Spock. However, for all we know, the mating might have been accomplished by means of genetic engineering, the biological sciences having gone through a development cycle comparable to what the physical sciences have in our time. The biological sciences are quite well extrapolated in "Star Trek" as evidenced by the mighty and totally incomprehensible medical technology used by Dr. "Bones" McCoy.

The action never takes place on Earth, primarily to avoid the more difficult and touchy task of having to make political and ideological forecasts. (Do Western shows ever return the action to New York City?) The center of action is the United Space Ship *Enterprise*, certainly not the first craft to bear that illustrious name, a factor that indicates that history has progressed in a reasonably uninterrupted fashion.

According to the teaser dialogue, the ship's five-year mission is "to explore strange new worlds, to seek out new civilizations, to go where no man has gone before." Actually, its mission is more than that. The U.S.S. *Enterprise* functions in much the same manner as a naval vessel of several centuries ago. In those days, ships of the major powers were assigned to sectors of the various oceans where they represented their governments and served the national interests of their respective countries. Out of contact with the admiralty office back home for long periods of time, the captains of these ships had very broad discretionary powers in regulating trade, fighting bush wars, putting down—or assisting—slave traders, assisting scientific expeditions, conducting exploration on a broad scale, engaging in diplomatic exchanges and affairs, and even becoming involved in such minor affairs as searching for lost explorers or helping a school mistress. Much the same sort of complex mission on land was also assigned to the U.S. Army in the days of the western frontier, and vestiges of this mission still remain today.

As a result, the U.S.S. *Enterprise* is a large, complex, armed, multimission ship. My first impression of it on the TV screen resulted in a chuckle at what I thought was the creative dream of some nonscientific art director. I changed my mind after reading Roddenberry's Guide and building the AMT plastic model of the ship—which, I am told, is the hottest plastic model kit on the market right now. Some real thought went into its design. Armed with the "Star Trek Guide" and the model, built to a scale of 1 to 600, I attempted to de-engineer the design to figure out why some future engineer might have done it that par-

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ticular way. It was good mental exercise.

The official designation of the United Space Ship *Enterprise,* registry number NCC-1701, is "starship class." Script dialogue reveals that there probably aren't many ships in this class, that they are probably the largest vessels in space, and that they command as much respect as a modern aircraft carrier does, or as a battleship or dreadnought used to. The *Enterprise* was built in space, and it stays in space; it has never felt a planet's surface beneath its hulls. It is divided into three main sections: the main, saucer-shaped hull, the cigar-shaped engineering hull, and the two side-by-side engine hulls.

The main hull is four hundred seventeen feet in diameter and about one hundred feet thick in the middle. The control room is located in the bulge atop the center of the disk, and the main ship's phaser weapons are on the underside. The impulse drive used for sub-light-speed propulsion is mounted on the aft rim of the disk. Why the disk shape? Perhaps to house some of the units of the FTL warp drive, perhaps to house "sensors," perhaps to contain defensive screen devices, perhaps to take advantage of the ship's internal gravity field generators—I couldn't figure this out; ask Lieutenant Commander Montgomery Scott, Senior Engineering Officer, next time the *Enterprise* goes past us in a time warp.

Scotty's province is the engineering hull, connected below the main saucer hull by a pylon. The engineering hull is nearly as large, volume-wise, as the main hull. At the front end of this three hundred forty foot cigar is a large parabolic sensor antenna. There are at least fifteen decks in the engineering hull, as opposed to eleven decks at the center of the main hull disk. At the aft end of the engineering hull is the shuttlecraft hangar with a door sixty feet wide and thirty feet high —large enough to accommodate an executive jet plane, if you want some current device to help grasp the size of the *Enterprise* hangar.

The two long hulls atop the ship and attached to the engineering hull by slender pylons house the main starship engines. These are not fission or fusion engines; those are old hat by this time. They derive their power by means of matter-anti-matter annihilation. They're pretty big—five hundred four feet long and fifty feet in diameter—but the power required to run the *Enterprise* and to drive a ship of its size at FTL speeds would be quite respectable, and even anti-matter engines would have to be fairly large to provide the necessary energy. Again, ask Scotty how they work; I slept through that lecture at the Academy.

The heavy-duty phaser rifles have appeared very rarely on the show.

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These engines are either highly efficient, or the design of radiators must have progressed mightily by that time. There are radiators on the pylon struts between the engines and the engineering hull, and there are several radiators on the engine hulls themselves. But they are pretty small. Obviously, matter-anti-matter engines of this design do not generate much heat.

When the main engines die—as they have occasionally on the "tube"—the ship's batteries can take over. Again, either the Star Trekkers are using a modern word for a new energy storage device nowhere near akin to today's batteries, or they've developed some fantastic batteries. Never mind. The ship's batteries do not have the energy drain potential to run the FTL drive, but they can run the sub-light impulse drive and the entire ship itself for about a week. (T'ain't impossible; used to take about a hundred pounds of lead-acid cells, or Edison cells, to run a radio receiver; today the whole schmear can be put in a tooth.)

Sub-light speeds are achieved by using the impulse engines mounted inconspicuously on the aft rim of the saucer hull. They aren't rockets. Dean Drive development, maybe? Or something derived from Davis mechanics and the consequences of the third derivative of the laws of motion?

A space-warp drive is used to achieve faster-than-light speeds. (No longer a total impossibility. Are you up on Feinberg's theories and tachyons?) FTL speeds are measured in terms of "warp factors." The formula for computing FTL speeds in terms of warp factors is surprising, and then again it isn't. The ship's velocity in multiples of the speed of light is the cube of the warp factor—i.e.: Warp Factor Two is eight times the speed of light, Warp Factor Three is twenty-seven times light, et cetera. Maximum safe cruising speed of the *Enterprise* is Warp Factor Six, two hundred sixteen "lights." At Warp Factor Eight, five hundred twelve "lights," the ship's structure begins to show considerable strain due to the inability of the ship's fields to compensate, so this boost is used only in emergencies, in hot pursuit, et cetera. Obviously, by this time period, Einstein, Lorentz, and Fitzgerald are as dated as Newton, caloric fluid, and Lucretius. There is no time dilation effect, the ship's screens in the control room show no relativistic abberation effects, and nobody becomes a plane wave at Warp Factor One. I'll buy the possibility that two hundred years of research permit this, but some scientists won't. Who cares? This is great fun!

Insofar as the structural soundness of the ship's overall engineering design goes, again who wants to argue with the technology two centuries in the future? Today's *Enterprise* model in styrene plastic is an

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Usually military force problems are taken care of with the hand phasers or the big phaser bank of the Enterprise *itself.*

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incredibly fragile thing but made from a man-made engineered material. Long before the time of the *Enterprise,* we will have created materials with strengths exceeding the ultimates published in Mark's Manual. After you've seen the boron filaments and composite filament materials now being mass-produced by General Electric, the apparently flimsy structure of the U.S.S. *Enterprise* doesn't seem to be flimsy anymore!

At any rate, the ship is a real deep-spacer and obviously has numerous internally-generated gravitation fields to hold the crew to the decks . . . and probably the ship's structure together as well.

To get around this huge starship rapidly, the crew uses the ship's turbo-elevators. These are lifts that can run *horizontally* as well as vertically. Obviously, something like this would be needed in order for the main characters to move around the *Enterprise* as quickly as they do.

The U.S.S. *Enterprise* is manned by a crew of four hundred thirty persons, approximately one-third of

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The most successful characterization—a surprise to all concerned no doubt!—is Mr. Spock, Science Officer and second in command. Here shown with the tricorder sensor of undefined but great potentialities.

them female. It is an international crew, completely multi-racial and even multi-planet. Although Mr. Spock is the only alien on the crew that we have seen, there are others who will probably figure in the action at some future time on the show.

At first, I felt that there were too many people in the ship because of the fact that the technology of that future time period would certainly permit a very high degree of sophisticated automation. Then I realized that, even today, policemen prefer to carry revolvers rather than automatic pistols. Reason: when you're

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in the clutch, you can't take the time to run and trouble-shoot an automatic machine. Automated machinery, even with trouble-shooting and auto-cutoff logic built in, has a tendency to tear itself to pieces when something goes wrong. Technology has nothing to do with this; it's a hard lesson that we've learned ever since—or even before—our ancestors put flying ball governors on steam engines. What chief engineer in the past century has not heard the immortal words, "But the automatic stop didn't stop!" To which he gave the immortal reply, "Well, why weren't you watching the automatic stop, huh?" Obviously, everything aboard the U.S.S. *Enterprise* that can and should be automated to relieve the crew of routine tasks *has* been automated—with trouble alarms and manual overrides, just like today's highly sophisticated space capsules. But everything that requires the human being's superior ability to make decisions and judgments on the basis of incomplete and illogical data containing many variables is under the control of an *Enterprise* crewman. (Watch for this point; it is well and subtly done on the show.)

The heart of the automated systems aboard the starship is the library-computer, a logical extrapolation of today's cybernetic machines. The *Enterprise* is really the outward skeleton and body of this integrated computer brain that completes the starship system. It handles astrogation, maintaining the life support systems, balancing the gravity fields and a host of other routine duties. As the First Officer and Science Officer of the ship, Mr. Spock's duty post is at the library-computer central panel on the bridge. The computer has voice-recognition circuits and self-programming that will permit it to respond to verbal orders; it, in turn, can reply through its vocoder in a feminine voice. The use of a feminine voice for the ship's computer is not "cute" or intended to be a gimmick. Even today the pre-takeoff systems computers used on the F-105 fighter, for example, speak to the pilots in a female voice because it has been discovered that the feminine voice not only penetrates noise better but is also something that men (and women) pay attention to! Apparently, it doesn't give a person the impression that he is talking to an emotionless machine. (Note that they still use female telephone operators in today's automated telephone systems!)

The computer is also a library with memory banks that contain a vast, correlated mass of data on history, arts, science, philosophy, plus all known information on other solar systems, colonies, and alien cultures; a registry of all space vessels ever built; personnel information on nearly everybody in the Star Fleet; and almost anything else in the way of information needed in

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any of the stories—a real *deus ex machina.*

In addition, all of the ship's vast and varied sensor systems feed into Spock's station. The type of sensors used are never identified, "sensor" being a generic term applied to any equipment aboard the ship capable of sensing or reading almost any sort of information. They probably include mass detectors, DeBroglie wave detectors, radiation detectors, radar, et cetera, and can also detect the presence of life. Mankind has been in the business of developing and using remote extensions to his own natural senses for a long time, and even today these sensors are getting more sensitive, accurate, and long-ranging. In fifty years, we've sensed the interior of the atom and beyond the farthest galaxies; in two hundred years' more effort, the level of sensing technology is likely to be quite high and also quite beyond our primitive comprehension.

The "tricorder" often carried by Mr. Spock, "Bones" McCoy, or Communications Officer Uhura, is a portable sensor-computer-recorder that looks like and is about the same size as many of today's "monocorder" tape recorders. A remarkable miniaturized device, the tricorder can analyze and keep records of almost any type of data, plus sensing and identifying various objects. Again, I am reminded of the first tape recorders of 1948; you could hardly pick them up, yet twenty years later you could carry their progeny around in a shirt pocket.

The same can be said of the "Star Trek" communicators, which don't seem to be so fantastic to our integrated-circuit-oriented minds. The little communicators are straightforward extrapolation of today's developments. And probably made in New Tokyo, too.

When it comes to weapons, swords and guns are passé—although they have been used from time to time on various Star Treks. Pure energy weapons, the phasers, are *de rigeur.* Call them blasters, or disintegrator guns, if it makes you feel better. There are three kinds of hand-carried phasers.

Phaser Number One is not much larger than a package of cigarettes and can be easily concealed along with a communicator on a belt hidden under a shirt. Phaser Number One is limited in range, power, and number of charges and is primarily used when Captain James Kirk does not want a party to be conspicuously armed—say, for example, during a "friendly call" or diplomatic mission by a landing party.

Phaser Number Two is a hand phaser snapped onto a pistol mount, the handle of which is a power pack which greatly increases the range, power, and number of shots. These are worn hanging visibly from a weapons belt.

There is also the more powerful phaser rifle with even greater effectiveness.

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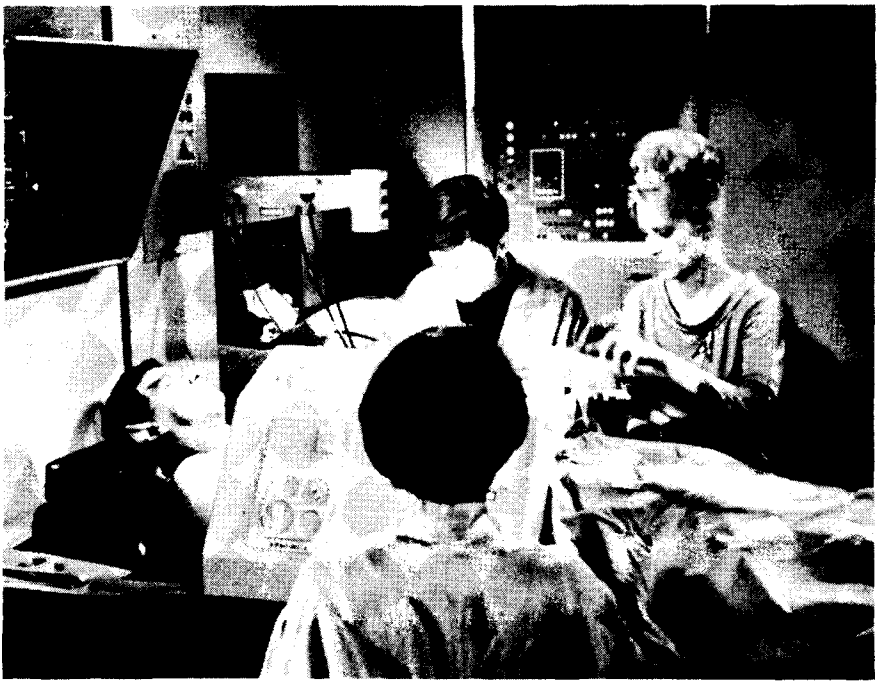

"Bones" has at his disposal the medical technology and equipment of some 200 years of development.

All hand phasers have a variety of power settings ranging from "stun" which can knock a man down and render him unconscious to "full effect" which can dematerialize a man. Intermediate settings can be used to cause an object to explode or to permit a phaser to be used as a tool or cutting torch.

Phasers can also be set to "overload" or to charge up their firing circuit or device to the point where it explodes, destroying the phaser and anything that happens to be nearby. Luckily, there is also a characteristic sound made by a phaser on overload as it builds up to detonation.

The "big guns" of the U.S.S. *Enterprise* consist of a battery of ship-mounted phasers deriving their power from the ship's engines. These are planet-busters. Phaser fire from the ship can be set for a sort of proximity explosion akin to a submarine depth charge, antiaircraft shell, or proximity-fused projectile. Such phaser bolts from the ship are probably launched as bound energy vortices in such a fashion that the binding energies de-

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grade with time until the whole energy bolt cuts loose. This sort of thing, naturally, has to be under quite close human surveillance from the human crews in the ship's phaser rooms. The helmsman, Mr. Sulu, is the ship's weapons officer, coordinating the phaser fire and using the ship's navigational aids to scan, track, lock-on, and fire on the captain's order. (Did you ever notice the fact that Kirk never has to repeat an order to Sulu?)

An additional item in the ship's weaponry inventory is a tractor beam, a sort of star-age grappling hook and towing line. But, since this is a rather common device in science fiction, everybody knows how and why it works, so there is no need to go into details.

Deflectors are of the same ilk. The U.S.S. *Enterprise* is well-equipped with them. There are navigational deflector beams which, triggered by navigational scanners, nudge aside any interstellar debris, dead suns, old planets, et cetera, that might get in the way of the *Enterprise* at Warp Factor Six and probably also protect the ship against the fantastic flux or hard radiation impinging upon it at or near Warp Factor One. The defensive deflector shields can protect the ship against all but the most sophisticated and powerful enemy weapons, but it takes lots of ship's power to keep this maximum shielding up under attack. When the defensive deflector screens are operating, the ship's transporters cannot be used.

The transporter is a rather unique device to "Star Trek," although similar devices have appeared from time to time in science-fiction stories. This is a device for converting matter temporarily into energy, beaming that energy to a point in space, and then re-converting it back into its original matter structure. No receiver is needed. Its range is about sixteen thousand miles. It can reach out to pick objects out of space. It is used to transport personnel between the ship and a planet's surface. A maximum of six people can be beamed by a single transporter at one time, but there are several transporter rooms in the *Enterprise*. Dr. Leonard "Bones" McCoy loathes the transporter, loudly proclaiming at the drop of a hat that he does not care to have his molecules scrambled and beamed around as if he were nothing but a radio message. Arthur Clarke, Isaac Asimov, and others have discussed transporterlike systems in various articles, pointing out the manifold problems such as scanning rates, bandwidths, et cetera, required. But Clarke himself has said that what is impossible for one generation is commonplace for the next. I have heard that a man in Washington thinks he has the transporter problem solved and is trying to build one!

The "Star Trek" transporter system may well be a genuine self-ful-

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filling forecast! It won't be the first in science fiction.

The medical art practiced by McCoy as Senior Ship's Surgeon is often as mysterious to us in the Twentieth Century as the transporter system. His medical sensors and instruments—with the exception of the "vital signs" display over each sickbay bed, a device which is rapidly to become commonplace in our own hospitals within a decade or so —are about as meaningful to us as the instruments of an African witch doctor. No doubt our hospital X-ray rooms and labs would appear the same to said African witch doctor. In spite of the fantastic futuristic medical technology commanded by McCoy, he has a genuine human fear that perfect medicine, psychotherapy, and computers may truly rob mankind of his divine right to wrestle a bit with life.

There are literally hundreds of other little touches and subtle bits of technology that pop up in "Star Trek" and whiz by unless the viewer looks for them. "Standard orbit," for example; that's one to seven thousand miles above a planet's surface, depending upon the planet, and is probably a one-hour orbit or other orbit based on orbital period. Or Starfleet Order Number One, which prohibits starship interference with the normal development of alien life and cultures. Or Stardate, which is based on decimal parts of a twenty-four-hour clock tied to human circadian rhythm, but not to months or years, which are strictly terrestrial cycles based on sun and moon.

In spite of mighty technology, however, human beings are still human among the stars, albeit advanced a little bit in the area of interpersonal and social relations. The U.S.S. *Enterprise* is manned (and womanned) by people we can understand and like—even Mr. Spock, who is perhaps more understandable than any of the others.

The United Spaceship *Enterprise* never leaves our galaxy; it doesn't have to, not with some hundred million planets to have adventures on. Given the wide-open futuristic technological base described herein, and given the major characters that you all know, there are adventures galore to keep the crew of the *Enterprise* warping across our screens for years to come, interweaving their adventures with pungent comments upon humanity, philosophy, and the whichness of what, and wrapped up in an optimistic projection of the future of mankind and the technological tools he is even now forging to control rather than to be shaped by his environment.

Humor? There is that, too. The "Star Trek Guide" itself ends with a series of questions usually asked by authors and replies from the producers. The last such question is: "Are you people on LSD?" Roddenberry's answer: "We tried, but we couldn't keep it lit." ■

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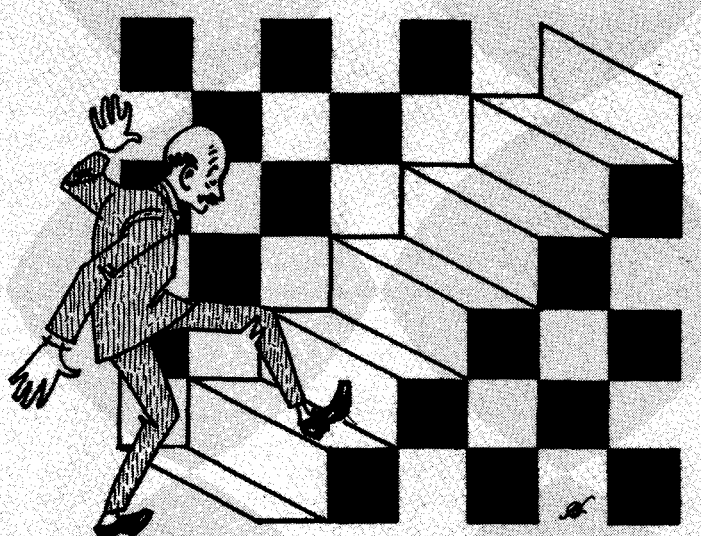
"If The Sabot Fits. . ."

Usually, a saboteur can be spotted on the basis of his connections and his motives. But if he has no motive, and doesn't know he's a saboteur—it gets tricky!

WALT AND LEIGH RICHMOND

Illustrated by Kelly Freas



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16:31:39 E.S.T. The University's Educational TV Show, "House of Blocks," was being broadcast to the town and taped for national distribution. On the screen, Boff, with his clownishly ineffective manner, turned to the stairs against a checkerboard wall behind him, and raised his foot to climb. But the stairs were no longer going up—they were upside down. Foot raised, Boff stared at them in wonder, and the children in a myriad homes and apartments howled with laughter. Boff moved his foot uncertainly, and the stairway changed position so that it was going up the side of the wall. . . .

16:31:39. An electric drill whirred in the hands of a workman drilling a hole in one of the steel ribs of a new skyscraper; paused; and whirred again . . .

16:31:39. An experimental circuit set up by a young electronics enthusiast responded happily and erratically to the line transients reaching his home from all the various switches and drills and electrical appliances close enough to affect the device. Each transient produced a *click* which, if listened to carefully, sounded like some secret code. The boy listened in fascination.

16:31:39. A computer clucked happily and regurgitated a check for the full sum that its register was capable of printing. The automatic mailing machine slurped up the check, slipped it into an envelope and slipped the envelope into the mail. All done without touch of human hands.

16:31:39. A computer in a chemical factory initiated the process of dumping a ten thousand gallon tank of perchloric acid into a mixing vat already full of other chemicals.

16:31:39. A repairman in Schultz Super Electronics Service watched an odd steplike mark of pulses go wandering across the face of his oscilloscope. Double odd, since the oscilloscope, though operating, was not attached to anything. Its leads lay loosely in the clutter of materials on the bench.

16:31:39. A canning factory on the outskirts of the city ground

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slowly to a halt as its computer issued an impossible order that jammed up sixteen conveyors simultaneously.

16:31:39. Twenty-five telephone callers hung up disgustedly as each realized he had reached a wrong number. The library computer delivered a hot sex novel to a spinster in search of a good murder mystery; and all the street lights in town flickered on for a moment, then flickered off again. The air raid siren wailed . . .

And the city was rocked by a tremendous explosion from the MiRite Electrochemical Works.

By the time the fire from the explosion was out, the local detective complement of the police force had been supplemented by the nearest FBI agents. MiRite was a highly secret government contract firm. Quiet calls had gone out for reinforcements. Reports were flooding in by then to police headquarters, and Chief Pat Flannagan was already over his head in esoteric jargon.

"To put it more cogently, Chief —somebody got an electronic signal onto the computer at one of our most important and most secret projects, and caused it to blow up the works. You remain in nominal charge, Pat," Dick, the FBI man who'd been in the area for some time, assured the chief kindly, "but . . . we're kinda going to take over the job."

Pat nodded sourly. "Glad enough for you to do it. Takes a load off my responsibility."

"Oh, it's your responsibility for the record. And you'll get the credit when we catch the saboteur."

"And what about if you don't catch him? I get credit for letting somebody wreck a secret project I didn't even know was here?"

Dick laughed genially. "We're still not admitting it. And the only kind of trouble you can get into is if you let on there's more to it than an explosion in a factory. You don't even suspect sabotage, for the record. You just go out and tell the reporters, who are already asking questions out there by the desk, that it looks like somebody got careless at MiRite, and the stuff they handle won't abide carelessness. Tell 'em you'll give 'em all the details as soon as you work them out. But first, I want every dick you have in plain clothes out there guarding the perimeter of the site. We'll take care of the inside with our own men; but I don't want it to be easy to get inside."

Pat nodded, issued the necessary orders, and strode out to the desk where his sergeant reigned supreme. The local news service and two wire men were waiting.

"Did the sergeant give you the details about the amount of damage, boys?" he asked, smiling.

"Yeah, Pat," answered the local news man. "But . . ."

"Well, I can tell you about what

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caused it, but not the exact details yet. Seems somebody got careless . . ."

"Yeah, Chief," one of the wire men said impatiently. "Did somebody get careless at the canning factory, too?"

"The canning factory?"

"Strauss & Rand. Out on River Road."

"What about Strauss & Rand?"

"They got a mix-up it'll take 'em about twelve hours to straighten out. Nothing serious, except a lot of man-hours and overtime."

Pat turned to his desk sergeant with one eyebrow raised.

"Nope, Chief. We haven't got anything from Strauss & Rand."

Pat turned back to the newsman. "What on earth has a jam-up in the canning factory to do with what we were talking about?"

"I don't know," he said. "I just heard it had happened, and it was the same time as the explosion. So I thought there might be a tie-in."

Pat smiled in relief. "Forget it," he said. "So my aunt's pet cat might have caused that explosion, too. It didn't. Somebody got careless." He went on to underline the details of the "investigation into the causes which underly such carelessness," was the way he put it. "The insurance investigators are doing a large amount of the work in that, but we are cooperating with them fully," he said pontifically. "There will always be human carelessness, but it is up to the authorities to see to it that safeguards are taken against a repetition . . ."

It was nearly dawn before the chief left his desk, what with reworking his schedules so he could give the FBI the most efficient help possible. So MiRite was a top priority government secret? Well, even his plainclothesmen guarding the perimeters mustn't suspect, he'd been warned; and he handled the details of assignments and reports himself as far as possible. By now, he realized, the town must already be swarming with plainclothes FBI men, but even he would not know who or what they were. He'd catch some sleep, he decided, then come on back. Make himself available if he could be of any use. Maybe get some inside dope. Not that he cared, he assured himself. It wasn't his problem. But he was interested.

No sooner had he opened the front door than his son, Tim, was urging him in the dark hall to come upstairs to his "ham shack." Actually it was his bedroom, but it had more the aspects of a ham shack than a place to sleep. Even the bed itself had to have the "electrona" as Tim's mother referred to all her son's equipment, cleared at least to the side before using.

"Up early, aren't you, Son?" Pat asked quietly after he'd closed the door behind himself and the youngster.

"I've been listening for you, Dad. Didn't want to phone you. Figured

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you'd be busy over that explosion —and it may not be important. But, well . . . I got signals on my new circuit today that . . . they were code signals, Dad. And I didn't want to worry Mother about it, but I thought I ought to tell you . . ."

Pat grinned fondly down at his son, ruffled the blond curly hair so like his own, a gesture he could only make these days when the boy was sitting down. Growing fast, he thought. Up to my chin. He'll be a six-footer, too. And the same bulldog-type face, he decided proudly.

Then he realized what the boy had said, and it lined up suddenly with his day's work.

"Code signals?" he asked cautiously. "What made you think they were different from ordinary Morse code? That's all over the airways."

"They weren't anybody's Morse code, Dad. They didn't sound like Morse. And they seemed to come in groups. But not quite random groups. And I had the source isolated. They weren't coming in over the air, but off the power line itself. I thought they might be computer, or teletype, signals like I know the electric company uses, but they didn't seem to fit that category either.

"I was running a check on line transients. It occurred to me that a statistical analysis of the detectable line transients would be something I could turn in to our Advanced Senior Math class. The professor's a nut on statistical math; and we're supposed to do a paper applying math to some form of analysis."

"Are those signals something new, or have they been going on for a while?"

"Well, gee, Dad, I don't know. I just got the circuit set up today. About 4:30 this afternoon. And there they were. And then they went away. And . . ."

Pat grinned. "Might be important at that," he said. "Could you describe them more exactly?"

Tim's relief and pleasure showed in his face. He must have been worried that I wouldn't take it seriously, Pat thought.

"I taped them. I was taping the transients. Here, I'll play them for you," the boy said, but his father shook his head.

"Wouldn't mean a thing to me. Let me have the tape. I'll let one of our guys listen to it that knows about those things. And Tim . . . don't mention this to anybody else, will you? And get some sleep. Even if tomorrow—today—is Saturday, you need your sleep."

Pat left the room tape in hand, and again closed the door quietly behind himself. But instead of going to his own room, he headed downstairs and out the front door.

Back at the office he yawned, sent for some coffee, and then called Dick. Wonder if he picked that name consciously or subconsciously, he asked himself, knowing full well it wasn't the man's real name.

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Monday morning, and Joe Newton stopped by the post office as usual before going on to his small machine shop. He was preoccupied, his mind already patterning out the day's work of turning out a special order for a small and intricate part. He unlocked his mail box, pulled out the one envelope, and took a look at the return address. Good. The check from . . .

A voice at his elbow said, "I'll buy you a cup of coffee while you open that." It was a statement, not an invitation. Joe turned, startled.

A stranger. The man was neat, neck-tied. Business man, Joe decided. "Why the hell should you?" he asked truculently, then realized he was being truculent, and half-grinned.

"You were sent the wrong check," the man said. "It was mailed before we discovered the error, so I came along to get it when you got it."

Joe walked slowly over to a long table against the wall in the nearly deserted lobby. "Let's take a look."

The check slipped easily from the envelope, and he looked at the name first. Joseph Newton. Then his eyes slid to the amount, and widened: $9,999,999.99.

Slowly he grinned. "Seems to be made out to me," he said.

"The check was an electronic error," said the man, sourly.

"Yeah. In my favor. Boy," he said, "that's some error!"

"I'll take it," said the man.

It was the way he said it. No question, no humor, no appreciation. Just, "I'll take it."

Joe eyed the other narrowly, up and down. "Mister," he said, "I don't know you from Adam, and I don't think I care to."

"I am the Claims agent for the firm's insurance company. My papers . . ."

"Papers be damned. This paper says I'm a millionaire." Joe had no illusions that the check could be made valid, but he didn't like, he decided, the way . . . well, the way the man wore his necktie. "I think I'll cash it."

"You can try." The man was developing a truculence of his own.

"Well," said Joe thoughtfully, "I think I should get a reward for honesty, *if* I return it."

"We can settle this legally, if you prefer." The man's voice turned nasty. "I have your proper check here."

What the hell, thought Joe. I'd just get involved with lawyers. He'd been hoping the check would get here this morning; needed the cash.

Suddenly he shrugged his shoulders. "Take the damned thing," he said. Then he looked at it in some awe. "Well, I was a millionaire for a few minutes, anyhow."

Pat was on his way to headquarters, driving slowly, when the sound of the drilling penetrated his consciousness. High up in the new building with its steel skeleton . . .

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Rat-a-tat-tat-tat. Tat-tat. Rat-a-tat . . .

"Could be," he thought, and speeded up the car.

"I'll get the electronics men on it. It could be a lead," Dick said doubtfully. "I don't think so, though. That tape your son made? It was code, all right. Computer code. And it could have done the job."

"Tim's always talking about resonance," Pat insisted. "That steel skeleton might have been resonating. And maybe it could have . . . sort of made a code by chance . . ."

"Thanks, Chief," said Dick, but his voice still sounded dubious. Then he leaned back. "This one's really got us. Whatever code was used threw at least two dozen other computers out of whack. We've just started on that angle, because we've just recognized it. I think your son's right. They put it on the power lines strong enough to get past the filters." He grimaced. "I've got my men checking all the computers in the area, but I think there's no doubt about it. And whatever else our saboteur may have accomplished, he sure cost a lot of companies a lot of trouble."

"Who else was affected?"

"Well, the chemical plant—and there's a man there ought to get a medal, except we don't want people getting together and comparing computer trouble that day. The computer there ordered ten thousand gallons of perchloric acid dumped into a vat that already had . . . oh, some other stuff in it. Would have been as big a mess as MiRite, if not as important. This guy noticed, and pulled the switch in time."

Dick had no sooner left than the sergeant intercomed a visitor, and a gangling young man walked timidly into the office.

"Yes?" said Pat, putting a soft note into his voice, and switching on the tape recorder hidden in his desk with a movement of his foot. The guy was—well, in his twenties, Pat decided; and he was obviously taking his courage in both hands. Confession coming up, Pat told himself.

"Chief . . . I . . ."

Put him at his ease, thought Pat; then, *We'll make a man of you yet, Son,* he added to himself. *Anybody with the courage to confess doesn't really want to be an outcast; doesn't have that 'professional' urge.* "It's O.K.," he told the young man softly. "You can tell me."

"I . . . got some signals last Friday . . ."

Inwardly, Pat laughed at himself. Jumping to conclusions, yet.

"Yes?" he asked, this time his voice more man-to-man.

"They came on about the time that . . . well, I gather that several computers went haywire. And they were . . . well, a step-ladder signal. On my oscilloscope," he added. Then, obviously sure that

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nobody besides himself could possibly know what an electronic signal was all about, he hastily added, "An oscilloscope's an instrument for registering . . ."

"I know about oscilloscopes," said Pat kindly.

"Well, Chief . . . the thing was . . . the oscilloscope wasn't attached to anything. Oh, it was plugged in and turned on, but I didn't have a load on it . . ."

"What kind of signals you get?" asked Pat.

"Sort of a stepladder. It must have been repeating at thirty cycles per second, because that's the way the . . . that's the frequency the horizontal trace was set to. And . . . well, I've never seen anything like it. But the pattern turned upside down and then right side up, and then just disappeared again."

Pat leaned back. "How come you came to me?" he asked.

"Well . . . I don't know, really. It seemed to me somebody should know about it. Somebody in authority? Just in case it was connected with . . . with anything that happened." The young man's face was getting beet red. "It was so . . . well, different."

Pat nodded, asked a few more questions, got an exact description of the stepladder, and let the young man go. Then he had a messenger take the tape of the conversation over to FBI headquarters.

The call from Dick came several hours later. "Thanks for the tape, Chief." The FBI man's voice made it clear that the thanks were of dubious quality. "Now we've got a real stickler. That guy's oscilloscope—we've checked—was, and is, in a completely different part of town. Miles out of the area. He lives in that trailer park about six miles out Pleasant Street. You know the one? Fresh Breezes Trailer Park, or something like that? Repairs radios out there in the Schultz Super Duper Electronics, or something. Schultz's is in a shopping center there."

"I know the place." Pat frowned.

"Do you know of any computers in that area we could check against?"

"Hm-m-m." Pat thought briefly. "There's an air raid siren out there —but no, that's controlled from downtown. Well . . . there's a telephone interchange not far south of there. At . . ."

"We'll play hell trying to check on any effects in a telephone interchange. But I'll see if there's any record from the area on the trouble-call channels for the time."

"You need to know, essentially, how broadly the signals reached? That it?" Pat asked suddenly.

"That's about it. Yes."

"All right. There are computers operating in various sections of town, even if not that one. Let's see. There's the library computer. That's outside of normal computer areas, and certainly out of the area

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so far covered. There are several at the University. And there's . . ." He stopped. Who all *was* using computers these days? Anyone with any sizable business. Even small business firms on a pooled basis. "Tell you what," he said. "Check IBM for computer locations. Then you can check the ones that would be outside the —former trouble area."

By Friday the puzzle was even more complicated. The signals had obviously emanated from at least a dozen different sources, probably simultaneously, but possibly in a quick sequence of confusing impulses. And the picture of the damage achieved by putting those overriding computer-code signals on the power lines could be estimated already in the hundreds of thousands; while the potential of damage that had existed ran into the millions.

Even discounting the MiRite supersecret project, the manhours involved in cleaning up the short period of electronic confusion would run—if anybody made official overall estimates, Pat decided —in the six-figure bracket. Banks had spent overtime locating unbalances; then checking the myriad business firms that might have made computer-coded deposits at that exact time. Except for the fortunate intervention of one alert individual, a second plant would have—well, the chances were that that one might have been completely destroyed.

There was a chemical firm that had had to dump its entire output for at least six hours time; there were innumerable pieces spoiled in computer-controlled lathes in machine shops. There were . . .

Pat had sweated all week. If the newspapers tumbled to this one, there'd be hell to pay. Nobody that he knew of—outside of the FBI and himself, and possibly one or two of his plainclothes men—had noticed the extent of the malfunction. The banks, and various of the company executives who had inquired about whether their own electronic malfunctions were more than local had been assured that the evidence pointed to an accidental signal, and that measures had been taken. He'd rather implied that the power company . . .

And my men, he thought, have better sense than to gabble. Even so, he'd had a conference with his own detectives the middle of the week, in which he'd casually brought up, in another reference, the question of talking about their work; and he'd underlined heavily the fact that idle conversation had dire results.

The afternoon sun was slanting across his desk, and he leaned back, rubbing the muscles at the back of his neck. Interconnectivity, he thought. Like the power and light grid and its east coast blackout, not so very long ago at that.

Interconnectivity. So much technology; and the technology run by

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the computer. Essentially. And we're only beginning to understand the ills to which a computer is heir. But . . . what of ten years from now?

Like the automobile, he thought. When it was first invented, the streets built for horses could accommodate cars, with a little resurfacing. Then there were too many cars, and highways were built, next throughways; and still the cars came on, and the cities were drowning and smothering in cars. And now, if one car had an accident, it was a pile-up . . .

Or electric power. When the technology of power had vanished for a few hours in that blackout, civilization had stopped, temporarily. And that blackout had been caused by one malfunction in one spot; a whiplash that started as a ripple and gained its power as it surged along the long lines, until with a snap it had blacked out technology throughout the northeast.

Only a six-figure damage and no deaths in this particular computer-sabotage, he thought. But ten years from now?

And then—sabotage? A pile-up of automobiles isn't intentional sabotage. The blackout wasn't sabotage. And the computer has a comparable interconnectivity . . .

He looked at his watch. Three p.m. Friday.

Abruptly he stood and thrust through to the sergeant's desk. "Get a car over to the school and have them pick up Tim," he said, brusquely. "Have them bring him home. Tell him I'll meet him there." Then as he strode to the door, he said over his shoulder, "Tell him it's all right. I just need some information, and he might be able to give it to me." He grinned and slammed out.

Tim was there in fifteen minutes, and Pat was waiting for him in his ham-shack bedroom.

Tim moved some of the stuff on his bed to give himself room, then sat down on it thoughtfully. His boyish face looked intent and serious, and Pat resisted the impulse to go over and ruffle the curly hair; but the feeling of pride and affection that went with that habitual gesture was welling through him.

"I . . . I reckon I don't know, Pop. You mean the code I picked up—last Friday, wasn't it?"

"Yes. That was computer code. Pure and simple computer code. And it affected almost every computer in town. But," Pat grinned, "that's top-secret information and I'll have you in Leavenworth if you breathe it."

"I know better than to talk, Dad." Tim's face was serious.

"I know you do." Pat made a decision. Better train him to know what he had to know. Tim wasn't a talker, never would be. "That signal —caused the explosion at the Mi-Rite plant." Tim looked surprised, but the expression quickly passed.

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"It nearly caused at least one other major explosion. It affected almost every computer in town—and I find, to my surprise," he added grimly, "quite to my surprise, that there are more than a thousand computers used in this town. Just counting the computer-computers, not the little everyday machines like radios and vacuum cleaners and telephones and traffic lights." He glanced at his son. "Gets awesome, doesn't it? You could call 'em robots, instead of computers, if you tried—not even have to try very hard. We're a computer technology these days, son, without even knowing it."

"And you think it was a computer put a signal on the power line here that day?"

"I don't know. I'm not really thinking. I'm just guessing. It was a computer code signal. And it was on the power lines. But the power lines for different parts of town are isolated one from another. And it was on all the power lines in town. Maybe at the same time, but certainly right within the same time area. It was probably a saboteur," he added sadly. "I was sort of hoping that that was a wrong guess, but the more I think about it, telling you about it, I guess it had to be a saboteur. The damage ran into the hundreds of thousands, if you add it all up. But nobody but us"—he grinned—"cops, have thought to add it all up. Everybody thinks it was just their computer."

"Well . . . uh . . ." Tim stood up and thrust his hands deep in his pockets, frowning, in unconscious imitation of one of his father's gestures. Then he walked in a preoccupied manner to the bench where the rig was still set up. "Without the roll of tape I gave you, I haven't had enough tape on hand to finish my experiment, but if I picked the signal up here—he pulled a hand from a pocket and flicked the device on, watching as the bench oscilloscope warmed up, and the little green trace began wiggling its way erratically across the face of the tube —"it had to be a pretty powerful signal. We're in a residential district. An isolated network. And that signal was coming through real strong."

He leaned forward and pointed out some of the sharp, erratic peaks that were being displayed on the screen. "These—the stronger ones —originate mostly right here in the neighborhood. Automatic refrigerators, switching on and off. Thermostats. People switching lights on and off. That sort of thing."

Then he leaned forward and gingerly disconnected the leads to the 'scope, held them out, arms outstretched, and nodded towards the screen. "That pattern, if you listen to it, sounds something like a bad filter capacitor in an ordinary radio. It took me a long time to find out what it really is. You see, I'm actually acting as an antenna. And the scope is just nonlinear enough to

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pick out the pulse pattern from that TV station down on Broad Street. I wrecked quite a few recordings before I found out that that silly buzz was the raster pattern for a TV picture."

Tim grinned and re-connected the leads.

"Would you get that pattern on the power lines?" Pat asked, a sudden guess making him alert.

"Yes. Once I'd identified it and started looking around, I found out that that combination thirty cycle and fifteen . . ."

"What?"

"Thirty cycle, Dad. The . . ."

But Pat was already heading for the phone downstairs. It took him almost a minute to get the local broadcasting studio on the line, and their head man on the phone.

"This is Chief of Police Flannagan," he barked. "What show's on at 4:30?"

"Why, the Educational TV show from the University. House of Blocks. They'll be on in five minutes, Chief."

"All right. You get your men ready to cut that show off the air as fast as it can be done, if necessary. Get your men ready, then stay on this line. If I say cut, don't take even *seconds* to do it. Do you understand? Shall I send a man up there to enforce the order?"

"I take it this is serious—an emergency? We'll obey, of course, and expect . . ."

"Never mind what you expect. Get your men ready." Then to Tim. "Get upstairs and fix that 'scope to catch the signal. If that pattern comes on, yell. Loud."

16:31:39. The University's Educational TV show was being broadcast to the town and taped for national distribution. On the screen, Boff, with his clownishly ineffective manner, turned to the stairs against a checkerboard wall behind him, and raised his foot to climb. But the stairs were no longer going up—they were upside down. Foot raised, Boff stared at them in wonder, and the children in a myriad homes and apartments howled with laughter. Boff moved his foot uncertainly—and disappeared from the screen.

It was a very angry professor who strode into the chief's office half an hour later. The chief, his son Tim, Dick, and an FBI electronics expert were waiting for him.

"Thank you for coming, Professor Boffington," Pat greeted him.

"I hope," the newcomer declared, "that you have a very good reason indeed for your actions this afternoon." There was no trace of the ineffectual manner that made his teaching so effective on the airwaves. "Our show is one of the few educational shows that has been able to out-rate the normal TV guff. And you want to sabotage a breakthrough like that!"

Pat nodded slowly. "Professor,"

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he asked, "would you say that the show was worth . . . well, exploding the MiRite plant?"

"And just what do you mean by that?" The professor was undaunted, still grim.

"It could have caused more serious explosions this time."

"You will please explain. Immediately."

"That checkerboard pattern you use . . ."

"A new introductory theme which will be built up and used to demonstrate visual patterning; the changes in patterning caused by light intensity and coloration; or even by the eye's—"

"Is run by a computer?"

"Yes. The changes are programmed—"

"The computer speaks computer language. And it was speaking to every computer in town."

"Nonsense. Computers are filtered against random signals."

Pat cocked his eyes at Tim, and the boy spoke up eagerly. "Sure, sir. They're completely filtered internally against any signal except a type of signal that is of the proper wave shape to operate the computer itself. The computer operates on yes-no impulses, and the internal circuits have to not only be able to handle those pulses but amplify them, and . . . well, gee, if you filtered *them* out, the computer wouldn't work.

"And then they're filtered externally against normal transients on the incoming power lines to keep the computer from receiving signals from other computers, and to keep it from broadcasting its own thoughts. But the pulse-pattern in which your checkerboard switched around was a computer-code pattern; and a lot of TV sets were pulsing to that pattern, reinforcing the code put out by your computer —and it got reinforced until it was more than any normal filtering system could stand. It got through to every computer in town, and it had a sort of . . . well it induced an electronic epilepsy. I guess nobody expected a signal of quite that volume to be broadcast from that many spots around town simultaneously."

"But why doesn't it happen all the time? TV is in constant use."

The FBI electronics expert spoke up. "The output of an irregular picture," he said, "is quite random and will be treated by the filters as a random signal. Even if it got into the computer a little, it wouldn't cause much interference. But that checkerboard-stairs pattern you use just happens to have been a projection created by a computer. And it had exact computer-language elements in it. Once it got through the filtering systems by being reinforced so thoroughly, the computers had no way of telling whether it was their own personal thought, or one from outside. So they went a little bit nuts. Or, as Tim put it, epileptic."

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"You mean it wasn't the computer itself that was putting the signal on the lines through the broadcast, it was from the *pattern* being broadcast?"

"The pulse of the pattern."

The professor wilted. "So we have to yank last week's tape—it's due for national broadcast next week. And kill that part of the show. And we can't use computer-coded effects." His voice was despairing.

"Oh, no, sir." It was Tim, leaning forward, intent, serious. "If you'll let me, I can filter that tape for you. Take the computer signals out. And . . . well, we ought to be able to design a filter for the transmit system that . . ."

Pat restrained an impulse to reach out and ruffle the boy's hair, but his pride was almost irrepressible as the FBI electronics expert and his son began jabbering in an esoteric jargon that was over his head but that seemed to indicate the situation was under control.

Dick, as thoroughly out of the conversation as he, moved quietly over beside him.

"What I don't understand," he said softly so as not to interrupt the others, "is how you managed to get the clues our guys missed? How did you get the connection?"

The grin that Pat had been withholding could break out now. All over his face. "That," he said, "is what cops are for. Tracing the connectivity between the 'criminal' and the 'crime.' " ■

The Analytical Laboratory

Every so often we need to reexplain the system of the An Lab to readers who haven't encountered it before.

1. The basic idea is that—obviously—this magazine is intended to please you-the-reader. It exists and continues to pay my salary, and the author's royalties, because you readers plunk down your cash.

2. While I hope some day to develop telepathy, so far I have no indications of it. In lieu thereof, I need feedback from the readers as to what stories pleased them—what they like (and don't like!) so I can guide further purchases. Your cards and letters to An Lab and/or Brass Tacks supply that feedback.

3. To make sure your votes have real meaning to our authors—the author that wins first place in the An Lab ratings gets a 1¢ a word bonus, the second-place winner, a ½¢ a word. This is not trivial; Harry Harrison stands to win $700 if you like his story as well as I—and he!—hope.

4. If an author's done you a good turn by doing a good story—you can do him a very real good turn; send in your vote. Simply send in a card, or letter, listing the stories in the issue in order of your prefer- *(continued on page 127)*

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Peek! I See You!

The trick of being unseen does not require invisibility;
it requires only unnoticeability.
In this case, the perfect camouflage involved
flashing lights, spinning magnetic fields, and shrieking colors!

POUL ANDERSON

Illustrated by John M. Sanchez

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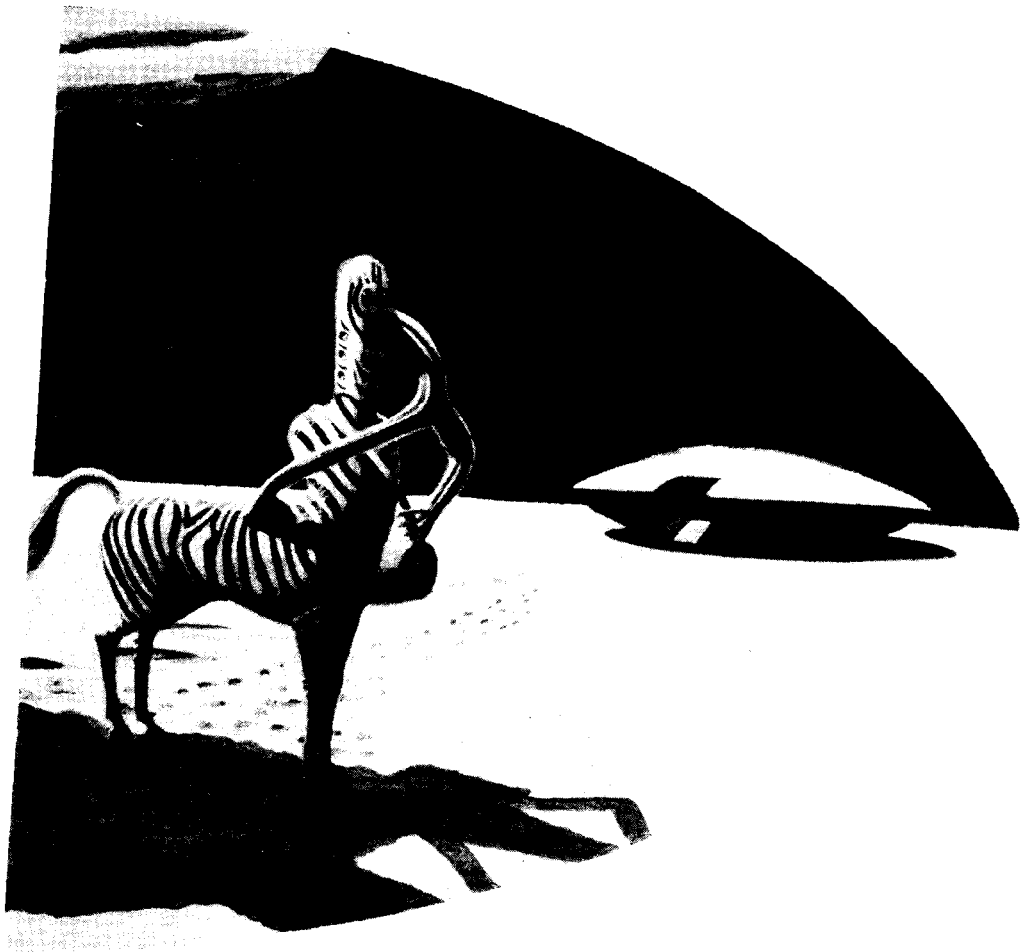

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The father of Sean F. X. Lindquist was an amiable, easygoing Boston Swede. His mother was, as might be guessed, an O'Kelly with a will of her own. Their genes combined to produce a son who was good-natured, a bit raffish, intelligent, disinclined to toil—but, on occasion, stubborn as Lucifer. And thereby hangs a tale.

Being expelled from college, for reasons having less to do with his grades than the president's daughter, he was drafted. Presently he was shipped to Asia. Though the general truce there had now lasted for several years, it was chronically unstable and everyone concerned maintained large forces close to hand. In due course, however, and with a certain feeling of mutual relief, the Army gave Lindquist his honorable discharge. He was enchanted with Bangkok, where he had been spending his leaves, and pulled wires to be demobbed in that city.

The enchantment wore off—she married someone else—and he made a leisurely way home around the world. Whenever his funds ran out, he did odd jobs. Some were very odd indeed. He was twenty-six before he reached the States again, and long out of touch. So he might have caught up on newspapers and technical journals; but he went instead to Las Vegas and updated himself in other fields. A true cliché calls luck a lady, apt to smile most upon men who do not pursue her. Lindquist departed with several thousand dollars in his pocket.

At this time the southwestern tourist boom was entering the steep part of its exponential curve. Lindquist remembered boyhood camping trips in the area. It occurred to him that he could make a pleasant living, and have his winters free, by starting an airferry service. The Four Corners country is famous for the grandeur and solitude of its uplands. But the time, effort, and expense of packing into those roadless mountains discouraged most potential visitors. Now if they and their gear could be flown in, and out again at an agreed-on time—if the pilot was available by radio in the meanwhile, to handle emergencies like lost can openers . . .

He took lessons and got his license. Then he bought himself a used VTOL aircraft and went to scout the territory.

Thus it was that he saw the spaceship.

He was droning leisurely along at about twelve thousand feet. The peaks were not extremely far below him. Their landscape was awesome: vast, steep, ragged, a ruddiness slashed by mineral ochers and blues, a starkness little relieved by scattered mesquite, greasewood, and sagebrush. Here and there, a streamlet turned the bottom of a canyon green. But mostly this was desert land, people-empty land, hawk, buzzard, jackrabbit and coyote land. The sun was westering in a

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deep, almost purple sky. Updrafts boomed briefly and trickily, shaking the plane in its course.

Lindquist's lean, sandy-haired, shabby-clad form sat relaxed. He puffed a corncob pipe and hummed a bawdy song. But alertness was in him. Before he tried carrying passengers, he must get familiar with this kind of flying. And he needed a place to roost for the night, preferably containing water and firewood. His eyes roved.

The vision slanted down before him. It moved at incredible speed, banked at impossible angles. Yet its passage was so silent that his own motor, his very pulse hammered at him. The shape, as nearly as he could tell, was roughly like a disk thickened in the middle. But the lambent, shifting colors that played across it, enveloped it in aurora, made such things hard to gauge.

It swung around, slid near, and his magnetic compass went crazy. For a moment he stared at what seemed to be a row of ports, glowing as if furnaces burned behind them. Far in the back of his mind, a reckoner clicked: *Diameter something like a hundred feet.* Otherwise he felt sandbagged.

The thing spun off. He grew aware that the pipe had dropped from his jaws. No matter. His hands were a-dance across the radar controls. He locked on. Reflection, yes! His compass steadied again. The vision dwindled . . . a mile away, two miles, three, shrinking to a rainbow dot, like the diffraction dots you see when you look sunward through your lashes . . . vanishing to nothing against mountain flanks and canyon shadows.

But it was real. Not just his rocking mind said so. His instruments did.

Other memories from boyhood and youth boiled up. "Judas priest," he whispered. "That's a sho-nuff flying saucer."

He opened the throttle. His plane leaped forward, roaring and shivering with power. He hadn't a chance of overhauling in a flat-out chase. But the thing did seem to be on a long downward track. Could he but stay within range, would it but land—

"Well, what then, bimbo?" he challenged himself.

He didn't know. But he relived vividly the arguments that had once fascinated him. The radicals had insisted that flying saucers were ships from outer space, operated by benevolent though green little men. The conservatives denied that anyone had ever seen anything. In this hour he, S. F. X. Lindquist, had been handed a chance to investigate personally. He had nothing to lose, and perhaps—if he could solve the mystery—a great deal to gain. Like fame and money.

Though no intellectual, he followed the news around him. Had he not spent the past several years in out-of-the-way places, he would

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have known that pursuit was a waste of time, that the riddle had, in fact, already been answered. But no one had mentioned this to him. Quite simply and naïvely, he lined out after the vision.

In the different cultures of the galaxy, Dorek's Law is known by many different names. Some call it Shepalour's Rule, some the Basic Law of Thermodynamics, some the Principle of Most Effort, and so on for millions of languages. But the formulation is invariant, because we all inhabit the same universe.

"Everything that can go wrong, will."

On their present voyage, the partners in the hypership had seen it in full glorious operation. There is no need to detail their woes with rickety hull, asthmatic engines, and senile computer. Nor need one describe what cargoes they carried, with what infinite trouble, from planet to planet. A tramp has to take anything she can get, and this is apt to be stuff too weird for the sleek cargo liners.

But they did think their fortunes had turned when they reached Zandar. A message from the brokers lay waiting for them. After discharging their load of sandorads—and, hopefully, getting most of the mercaptan odor out of the vessel—they were to pick up some machine tools for New Ystanikkinikkitantuvo. Plain machine tools, harmless crated metal! Of course, the destination was far out on the Rim. So much the better, though. It would be a peaceful haul, with lovely pay accumulating; and then, having been gone as long as they'd signed for, they would head home, loaded or not; and the fleshpots of the Core had better be filled in advance for them.

But a summons came from the port coordinator.

Pazilliwheep Finnison went along to the office. The coordinator was not of any species he recognized, possessing three eyes and a good many tentacles. They studied each other for a few seconds.

The spacefarer was from Ensikt. He was a diopt himself, though the eyes were quite large and dark, contrasting with blue stripes upon glabrous orange skin. (The air being thicker, wetter, and hotter than he was used to, he went nude except for a musette bag.) His body was slender, centauroid, with a gracefully waving tail. He breathed through rows of gill-like organs on either side of his long neck, which alternated with aural tympani. Albeit he thus had no nose, he did sport a muscular trunk above his mouth. It split into two arms that ended in boneless four-fingered hands. This was entirely practical on Ensikt, where gravity is comparatively weak and animals comparatively small. Pazilliwheep stood three feet high at the rump.

"Ah . . . Navigator Pilot Finnison, H/S *Grumdel Castle* . . . yes,

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yes. Welcome," said the coordinator in Interlingo-5 with a flatulent accent. He punched a button on his data screen and regarded what appeared. "Yes. Correct what I was informed. You are clearing for . . . yes, that part of the Rim . . . with a stopover at . . . what is the name of the planet?"

Pazilliwheep automatically jerked his tail, then said in haste: "My gesture indicated indifference."

"Were you afraid it might be objectionable in my culture? No, we have no tails. Now about this . . . yes . . . confounded planet. Never heard of it till the other day. Catalogued as— But what's the name?"

"Tierra, Earth, Mir, Jorden, die Erde, et cetera, et cetera." Pazilliwheep's vocal apparatus formed the sounds rather well, except for a lack of nasal quality. "Hundreds of autocthonous words. Most of them translate as 'Dirt.' "

"So. Yes. I see." The coordinator had kept one eye on the unrolling data. "Primitive world. What do you call it?"

"Restocking Station 143."

The coordinator waved a tentacle in the air. "I indicate assent and understanding. Well, Navigator Pilot, this is quite fortunate. Yes, fortunate. You came at, shall we say, the strategic moment. You are, therefore, able to be of material assistance to the Galactic Federation. Intergovernmental Department of Planetary Development, Bureau of Supervisions, to be exact."

Oh, oh! thought Pazilliwheep, and braced himself for bad news. But it was worse than he feared:

"Yes, you can, and, therefore, you . . . are herewith instructed to . . . furnish transportation and every necessary assistance . . . to the sector inspector."

"No!" Pazilliwheep cried. His four hooves clattered on the floor when he sprang backward. "Not the sector inspector!"

"Yes. The sector inspector. New one, you know. Anxious to make a good showing in . . . this latest assignment. Came here to check local records. Found no official investigation of that particular planet had been made for a long time. Yes, much overdue. Entire intelligent species being neglected. Perhaps, even, slyly exploited by the less scrupulous. Eh?"

"Exploited, my lowest left operculum!" Pazilliwheep protested. "What the entropy would there *be* to exploit? Besides, their principal culture belongs to the Federation. If they have any complaints, they can go through regular channels, can't they? And say, why doesn't the inspector go in his own ship?"

Remorselessly, the coordinator answered: "Economy drive at GHQ. Inspectors for outlying regions do not, shall we say, rate their own vessels any longer. They use available transportation. Yes, I know, they're always behindhand anyway. Too many planets. And a sector like this—not even important enough

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for records on it to clutter central data banks on any Core world—do you see?"

"But . . . listen, the *Grumdel*'s an old wreck. We've got the stingiest owners in the galaxy. My engineer's trying to repair a fusion tube right now. The interior maintenance units keep breaking down, too. Our top hyperspeed is a hypercrawl. Anything would be better!"

"No doubt. No doubt. But nothing else available. Not soon. Every other vessel due here within the next several weeks is a liner or else on time charter. Or, of course, not crewed by oxygen breathers. You may be old, Navigator Pilot Finnison; you may be rusty; you may be underpowered, vermin-infested, and all but certifiably unspaceworthy; but you are the best I can do for the sector inspector. And, yes, my own career—promotion off this dreary mudball—his reports to GHQ—you understand. Yes. You are hereby commandeered." And the coordinator handed over the official orders with a flourish.

Thus Hypership *Grumdel Castle* departed Zandar with a third being aboard.

The inspector was a good fellow at heart: young, inclined to take himself and his work overly seriously, but well intentioned. He apologized for the trouble he was causing, and reminded his hosts that their owners would be compensated according to law. His hosts showed no great enthusiasm at this. He explained that a major reason for his having picked their ship was that she was already scheduled to lay over on 143— "And might I inquire, out of a wish to become more intimately acquainted with my companions as well as for the technical information itself, not to mention simple curiosity, what activities you have planned on this planet?"

He used Interlingo-12 rather than any language of his own world, Ittatik. Unfortunately, Pazilliwheep did not speak Interlingo-12. Engineer Supercargo Urgo the Red did, more or less, and translated into his version of Interlingo-7:

"He says what're we gonna do there?"

"Well, no reason not to tell him the truth," Pazilliwheep replied. "Unless you've got some other little racket you haven't told me about."

"When we touch maybe once in three years? Don't make me laugh. It hurts."

In point of fact, Pazilliwheep had a racket of his own. It was a mild one, and might even be legal, for all he knew. He swapped small quantities of ondon oil, which had turned out to have powerful aphrodisiac effects on the natives of 143, for kitchenware. The latter was unusual and artistic enough to command good prices on several more advanced worlds. This was one reason he did his restocking on 143 whenever possible.

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"Let's answer his question by reciting common, elementary knowledge," he suggested to Urgo. "Might put him to sleep, at least."

"Is any knowledge common?" wondered the engineer supercargo. "Like, it's a big galaxy. *I* never heard o' whatzisname's muckin' civilization till now. And still he says it fills a whole muckin' star cluster! Maybe he don't know how we operate in this spiral arm."

"Oh, I suppose the basic procedures are similar everywhere. If nothing else, in the course of ten thousand years or however long it's been around, wouldn't the Federation have had some leveling influence on the member species?" Pazilliwheep tail-shrugged. "We haven't anything better to do. Suppose you translate as I talk." He filled his lungs and began:

"It's a long way between stars in this thin outer part of the galaxy. And it's even longer between up-to-date systems that are normal ports of call. So ships are apt to need fresh supplies en route. Maybe the deuterium runs low, or the protein, or—lots of things. Or else, because no ship has perfect biochemical balance, it's necessary to stop on a homelike world and flush out accumulated by-products with fresh air. Planets suitable for the various types of space-going life forms are listed in the 'Pilot's Data Bank and Ephemerides' for each region."

"He says we gotta tank up," Urgo told the inspector.

Klak't'klak of Ittatik nodded, signifying assent in the same way as most 143an cultures. The head he used for this purpose also resembled the 143an, and those of both his shipmates, in that it had two eyes and a mouth. However, mouth and nostrils were set in a beak that brought the narrow skull to a point. A fleshy aileron grew from the top, counterpart to the rudderlike fluke at the end of a thin tail. The body in between had, like Pazilliwheep's, evolved from a hexapod. But on Ittatik the rear limbs had become legs terminating in claws to grasp branches; the middle limbs had become skinny arms with six-digited hands; the forelimbs were now leathery wings. A keelbone jutted from the deep-chested torso. When he stood erect, Klak't'klak's nude gray-skinned frame was of slightly less stature than Pazilliwheep's; but his wingspan was easily twelve feet. Nonetheless, he could not fly here. The ship's G-field was set lower than his home gravity, but the air was so much thinner that he couldn't stay healthy without artificial help. This took the form of a pomander which he kept lifting to his face. The oxygen-generating biochemicals within smelled like rich swamp ooze.

"The requirement is understood," he said, "and obviously biological maintenance problems alone suffice to compel your descent into the planetary atmosphere. The point,

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however, which it was desired to make, is that a primary reason for the selection of this vessel as my transport was that you were, indeed, planning to restock on the world in question. Furthermore, your cargo is not perishable nor urgently required by the consignee. Thus the sum total of inconvenience and delay is minimized. Admittedly, I may be the cause of your remaining for more than the few 37.538-hour periods you presumably reckoned with. But if all appears to be in order, if there is no clear need at this point in time for further investigation of the possibility that ameliorative action may be required somewhere upon the globe, then we should be able to proceed within two or three months. I will not insist upon being returned to Zandar, but will rather continue with you to the Rim, where I shall debark in order to instigate a study of conditions prevailing upon that frontier."

"Oh," said Urgo. To Pazilliwheep: "He says we'll be stuck there for at least two or three months."

"Oh!" said the navigator pilot, rather more pungently. "Will you ask his unblessed bureaucratship why the inferno he wants to excrete away so loving much time on one unseemly little ball of fertilizer?" Likewise rather more pungently.

"No fair," grumbled Urgo. "I can't talk to him like that."

Klak't'klak explained. He wasn't really much interested in 143. His primary mission was to make sure that things were going well on the civilized planets of the Rim, and recommend remedies to the Federation authorities for whatever he found amiss. Still, 143 was overdue for inspection—seeing that it housed one nation that belonged to the great confraternity.

Such membership confers certain privileges. They are not many, because a galactic-scale league is necessarily a loose one, little more than a set of agencies serving the common interests of wildly diverse cultures. But a member is entitled to some things: for example, technical assistance if it wishes to modernize in any way.

"No," said Pazilliwheep, "our friends on 143 aren't what you would call the go-getter type. They're content to sell us their services, use of landing space, a few kinds of goods. Mainly they take biologicals in exchange—you know, longevity pills and, uh, other medicines. Ask them yourself if you doubt my word."

"I do not, of course," Klak't'klak answered through Urgo. "But I gather the planet holds numerous cultures. Perhaps they are being treated unfairly. Might they not, for example, be worthy of Federation membership too?"

"Chaos, no!" Pazilliwheep paused. "Well, I suppose they're no worse than some I could name. But

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no better, either. We do make spot checks, we traders, in the hope of finding new potential markets. But the majority of 143ans haven't shown any improvement in the better than two centuries that the blob's been visited. They've got a drab, fragmented, quarrelsome, early-mechanical kind of civilization. Last time I was there, we noticed traces of manned landings on the single moon. That indicates the stage they're at. If they learned the Federation exists—"

"They would have to be admitted to membership if they asked."

"Exactly! And can you imagine the results? Those dismal characters would yell for so much technical assistance that their whole planet would be one gigantic college for the next fifty years. Sector taxes would go up ten percent, I'll bet, to finance it. We'd have to stop using our base, probably, because of their confounded nationalistic regulations about passports and I don't know what other nonsense. And there isn't as handy a planet for us within a hundred light-years." Pazilliwheep gestured violently. "And all this sacrifice on our part for what? To add one more lousy space-traveling species—competing right in our trade lanes to the Rim!"

"You are satisfied with the status quo, then?"

"Right. The 143ans who do know about us and do have membership are friendly, dignified, unaggressive, mind-their-own-business people who'll work for us when we need help at an honest wage for honest labor, and who produce salable handicrafts. Do you wonder that we hide our existence from everyone else?"

"No. Frankly, I cannot help suspecting you underpay your native help; that is what 'honest wage for honest labor' usually means. But I am more concerned with ascertaining whether the planet has other civilizations that would, on balance, prove an asset to the Federation. Rather than read the sporadic reports of untrained and biased observers, I want to investigate and decide for myself."

Even through Urgo's translation, Pazilliwheep noted how Klak't'klak had dropped his elegant periods for shorter sentences in a sharper tone. The navigator pilot sighed and resigned his soul. All right, he'd be hung up for a while on 143, chauffeuring the sector inspector around, assisting with instruments, catching natives for interviews. (This was done in such wise that, after they were released, no one believed their story. Experience had shown that the best ploy on 143 was the Benign Observers of Elder Race.) He and Urgo would be at once busy and bored.

Yet . . . eventually they'd start drawing overtime pay. And the mission on 143 wouldn't likely be prolonged. If nothing else, *Grumdel Castle* was uncomfortable. Her

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cramped cabins, vibrating decks, rusty metal, chipped plastic, wheezy ventilators, and uninspired galley saw to that. In addition, she carried so few books and tapes suitable for Klak't'klak that he would have them memorized in weeks. Pazilliwheep and Urgo always laid in recreational materials before a voyage. But what use to an Ittatikan were Ensiktan murder mysteries and Bontuan pornography?

And so *Grumdel Castle* creaked and groaned the long dark way to the Solar System. She took up orbit around the third planet while Pazilliwheep checked for indications of excessive radioactivity, smog, and other hazards of an early-mechanical culture. Meanwhile Urgo the Red went outside to install camouflage tubes on the hull.

His shipmates saw his fur as bright blue; but then, they didn't use a visal spectrum identical with the Bontuan. The engineer supercargo was a tailless biped, eight feet tall and broad to match. His head was round, short-muzzled, big-eyed, fuzzy, and rather endearing. His hands were five-fingered, his feet four-toed. In spite of his hirsute skin, he affected white coveralls, sandals, and an ornate belt.

He clumped in again and shed his spacesuit. "Guess they'll hang together a while," he reported, "but if the owners don't spring for a new set when we get home, I'm gonna look for another berth. How's the planet doin'?"

"About as before. I note more air traffic each time, though, damn it," Pazilliwheep said. "Also, today, what appears to be a manned orbital satellite. We'll have to wait here till the stupid thing's on the opposite side of the globe."

Klak't'klak inquired why they lingered. Urgo explained. *Grumdel Castle* used a camouflage standard on worlds of this atmospheric type, where it was desired to fly unbeknownst. The natives could not detect an operating hyperdrive; if they had that capability, they'd soon be making their own star ships! And antiradiation screens served to control air molecules as well as atomic particles, making even the fastest travel soundless. But you were still stuck with the fact that your ship was a solid, visible, radar-reflecting object.

So you wrapped her in the gaudiest ionized gas-discharge effect you could generate. You added powerful magnetic and electrostatic fields, and varied them randomly. You sailed in, alerting every eye and every instrument for a hundred miles around—

Just like a natural traveling plasmoid.

But since those erratic masses of molecules and electrons occur in atmosphere, and the ship was in space, she must first sneak down.

Presently she did. Near her destination, she spied a native aircraft. At Klak't'klak's request, she veered close so he could get a good look.

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Then she headed off for the home of that 143an people who, during the past two hundred years, had been members in good standing of the Galactic Federation.

On the assumption that the flying saucer would continue in a straight line, Sean Lindquist zigzagged along the same general path. After half an hour he was rewarded. He crossed above an immense red ridge. Its farther slope tumbled into a canyon whose bottom was the most vivid green he'd spied in a long while. Squarish adobe buildings were stacked against one rock wall, overlooking a stream lined with trees. But what made his pulses jump afresh was the object that lay before the houses. The dazzling, confusing play of colors was gone; the shape had definite outlines and a dark gray hue; but it was surely the thing that had buzzed him. And by all the saints and any heathen gods who cared to join in—it *was* a vessel!

He tilted his airplane's wings, crammed on power, and whipped back the way he had come. A thermal nearly tossed him from control. But he must get out of sight before he was observed and—

And what? Some kind of ray gun shot him down? He ran his tongue across lips gone sandpapery. The ship had to be from outer space: real outer space, the unimaginable abysses that held the stars. He'd followed the progress of flybys and landings within the Solar System. Hence he knew that, while the saucerians might be little and emerald-colored, they were not from any neighborhood planet. He also knew enough aerodynamics to be sure no terrestrial organization was experimenting with stuff that advanced. Even if he had been ignorant of the engineering requirements, he was learned in the ways of public relations offices . . . "Stop maundering, will you?" he croaked.

What to do?

He kept the plane wobbling back and forth on the far side of the mountain while, feverishly, he studied his charts and tried to discover where he was. Uh, yes . . . "Wuwucimti," plus the symbol for Population 0-1000 . . . evidently a pueblo, and lonely as hell, to judge from the fact that nothing led away from it except a dim mule trail . . . Numbly, like parts of a machine rather than a body, his fingers activated the radio. If he could raise, oh, Gallup or Durango or wherever . . . make his location known, so it wouldn't do the aliens any good to destroy him . . . A distant seething filled his earphones. Whether atmospherics or They were responsible, he couldn't get through.

He got his pipe off the floor, reloaded and relit it, and fumed himself into a measure of calm. A long gulp from a bottle that lived in his sleeping bag was equally helpful. *Consider, Lindquist,* he thought. *You've stumbled on a secret to*

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shake the world. But this is hardly our first visit from yonder. Leaving aside the mistakes, the hoaxes, and the claims of the nut cults, there always was a certain amount of saucer observation that couldn't be explained away. At least, it was easier to believe in spaceships than in some of those concatenations of coincidences that the orthodox scientists postulated! And now you've got proof that the ship hypothesis is right. Only, who's going to take your unsupported word? Supposing you could go fetch witnesses, the thing's bound to be gone when you return. You'd get classed with Adamski and his breed.

For which same reason, you'll keep your mouth shut.

Hey! he reflected with rising eagerness. *How many people have actually met saucerians, and been disbelieved afterward? And, on that account, how many more have met them and—not wanting to be laughed at—simply kept mum?*

After all . . . what little consistent evidence there is—indicates the saucerians aren't evil. They're shy, or snobbish, or something, but I can't remember anyone ever claiming that they do any deliberate harm. So maybe, this time, I can—

Allowing himself no second thoughts, Lindquist brought the plane about. He roared back over the mountain, chose his position, tilted wings, and commenced vertical descent.

Updrafts were tricky; and this was a somewhat battered, cranky craft he had. For a while he was too occupied with controls, instruments, hiss and shudder around him, to heed much else. He did see how the saucer squatted imperturbable in the bright late sunlight. Tawny mud-brick walls, red canyon sides, deep blue sky, green meadows and cornfields, green cottonwoods and willows along the quicksilver stream, dusty sage and juniper farther back —and in the middle, a spaceship from the stars!

His landing gear touched. He cut the power. Silence hit him like a thunderclap. He unharnessed, opened the door, and sprang shakily forth. The air was thin, dry, pungent with resinous odors. Except for a breeze, tinkle of water, bleating from a pasture shared by sheep and goats, the silence continued.

It was not broken by the approaching locals. They were ordinary Pueblo types, a few hundred medium-sized dark-complexioned folk of every apparent age. Men and women both wore their hair in braids. Clothing varied, from more or less traditional breechclouts, gowns, and blankets, to levis and sports shirts. Lindquist's sharpened perceptions noted that the people were better clad, seemed more healthy and prosperous, than the average southwest Indian. And they were strangely uncordial. Not that they threatened him. But they drew up in a kind of phalanx, and stared,

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and said never a word. Even the littlest children sucked their thumbs in a marked manner.

Lindquist gulped. "Uh . . . hello," he said. His voice sounded very small to him. "I'm afraid I, uh, don't speak your language." They might know Spanish. *"Buenas días, mis amigos."* Trouble was, that damn near exhausted his Spanish.

A grizzled, weather-beaten man called softly, "Sikyabotoma." Lindquist said, "I beg your pardon?" but decided it was the name of a young man who stepped to the elder. They put heads together and conferred in mutters.

Lindquist gulped again, nodded, pasted on a smile, and started toward the flying saucer. At once he grew so conscious of it—so astonished, for instance, at the pitted, corroded metal of what had once been a smooth unitized shape—that the Indians faded from his mind. Colliding with them was a shock. Several had moved to intercept him.

They were embarrassed. The pueblo dwellers are among the politest beings on Earth. They smiled, in a forced way, bobbed their heads and waved their hands. They pushed gently on Lindquist's arms, as if to urge him toward their houses.

Anger flared. "No, thanks!" he snapped, and planted his heels.

The young man rescued the situation. He was among those who wore modern clothes, including the gaudiest sombrero Lindquist had ever met. He sauntered forth, tapped the newcomer on the back, and said, "Excuse me, buddy. That's not the way."

"What?" Lindquist whirled to confront him.

"Welcome to Wuwucimti Pueblo," the Indian said. "I'm Sikyabotoma. But in the Army I used the name Joe Andrews. Picked that because it's handy being near the head of the alphabet. So if you want, call me Joe. Come on inside and have a drink."

"I . . . I thought . . . you—"

"You needn't be surprised. Sure, the Hopi don't approve of liquor as a rule. But they need somebody like me, who's equipped to handle white men. Like, I interpret when we take the mules to town and stock up on things. And I did do a military hitch. So I've gotten a few outside habits. It's good bourbon."

"But . . . I mean—" Lindquist twisted his neck to goggle at what lay now behind his back. "I never imagined—"

"Yes, it is unusual," Sikyabotoma agreed cordially. He linked arms with Lindquist, who must needs come along as he ambled in the direction of the village. "We're the most isolated pueblo in the country. Not awful old. A bunch of Shoshonean-speaking Hopi moved here to get away from the Spaniards after the revolt of 1680 was put down. So we have a tradition of minding our own affairs, and we discourage visitors. Nothing rude, you under-

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stand. We just don't do anything interesting when the anthropologists come. And we got rid of the missionaries by telling the last padre who showed that we'd already been converted to hard-shell Baptists."

The other Indians trailed after at some distance. They kept their silence. "Please don't think we're hostile," Sikyabotoma urged. "We're only satisfied. We combine the old and the new as suits us best; and we do quite well for ourselves, on the whole; and everybody among us knows it. Regular contact with the outside world would upset our applecart. So we act pretty unanimously to defend our privacy. Unanimity comes natural in the Hopi culture anyhow. If you're in trouble, we'll help you, Mr., uh . . ."

"Lindquist," said Lindquist feebly.

"We'll do what we can for you. But if you dropped in out of curiosity, well, I hate to sound inhospitable, but the fact is you'd find Wuwucimti a mighty dull place. Lively young fellow like you, huh? I'd suggest you proceed right away. And, uh, I'd take it as a favor if you don't mention this stop you made. We're not after tourist business and that's that. You savvy?"

"Dull?" Lindquist tore loose. He spun, flung out both arms toward the great spaceship, and shouted, "You call that dull?" so echoes rang.

"Well, not to me, of course," Sikyabotoma said. "I get my kicks. And the average pueblo dweller is staid by nature."

"Flying saucers and . . and . . ."

Sikyabotoma regarded Lindquist narrowly. "Do you feel O.K.?" he asked.

"Sure, I feel O.K.! What about that flying saucer over there?"

Sikyabotoma squinted. "What flying saucer?"

"What do you mean? I . . . I . . . I chased it . . . to here . . . and there it sits!"

"Awa-Tsireh," called Sikyabotoma, "do you see a flying saucer?"

A middle-aged Indian looked solemnly back and shook his head. "No," he grunted. "No see fly saw-suh."

"I'll ask the others in Hopi if you want," Sikyabotoma offered. "But you know, Mr. Lindquist, when people aren't used to this thin air and sun glare, they can mistake mirage effects for some of the damndest things. I'd be careful about that if I were you. Flitting around in an airplane, a guy has to be mighty sure what's real and what's an optical illusion. Doesn't he?"

Lindquist stared for an entire minute into the broad bland face. The others moved closer, and had also begun to smile and murmur soothing words. Briefly, in his tottering mind, he wondered if he was not indeed the crazy one.

No! He sprang back and launched himself. His legs flew. Dust spurted, the footfalls slammed through his

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shins, and he made an end run around the tribe. Meanwhile he bawled:

"Do radars have illusions? Do compasses? By heaven . . . let me . . . at my instruments . . . and I'll show you!"

He reached the ship. Its curve swelled immense above him, casting a knife-edge shadow. He snatched a rock and pounded the metal. It boomed. A lizard ran away. The sandstone crumbled under repeated impacts. "Is that optical?" he screamed.

The Hopi had been running toward him. But once more they halted at a distance. Sikyabotoma came nearer. The young Indian stopped, regarded Lindquist, and sighed.

"O.K.," he said. "I didn't really expect it'd work. Have your way, Charlie."

He semaphored with his arms.

Lindquist stepped back from the ship, panting, sweating, trembling. The canyon brooded in a quiet immense and eternal; only the wind had voice. Then came a rusty creak.

Someone had been watching from inside, through some kind of television. And in some fashion, a part of the hull detached itself on three sides and unrolled, to make a gangway to the ground. Three creatures came forth. Lindquist saw them and strangled on an oath that was half a prayer.

Sikyabotoma took a philosophical attitude. "You ought to see what membership in the Galactic Federation has done to our kachina dolls," he remarked. "The real ones, that we don't show the anthropologists."

"This is most annoying," Klak't'klak said. He flapped his wings. They made a parchment rustle where he squatted in the sunshine, under the spaceship, confronting the bug-eyed 143an.

"Sure is," Urgo the Red agreed. "We gotta get rid of this bum. And then we gotta stay away from here for several days—prob'ly go into orbit—in case he does somehow talk somebody into comin' back with him. Right when I was hopin' to get that Number Three regulator tuned!"

"I was thinking more personally," the inspector admitted. "I am not prepared to conduct interviews. That is, my translating computer has not yet assimilated the records of this planet's dominant languages which the autochthons brought me from their . . . ah . . . what did they call it? . . . their kiva. And I hate working through interpreters."

"So don't."

"No, as long as we have captured this being, I feel my duty is to examine him for whatever information he can give. And, too, I should endeavor to allay his fears. To this poor unsophisticated semi-savage, we must resemble veritable demons. Consider how he staggered to his aircraft for that bottle of

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tranquilizing medication he now clutches so tightly."

Urgo waved a massive blue hand. Pazilliwheep trotted over, using his nose-tendrils in turn to summon one of the Indians. "I don't speak this barbarian's jabber," the navigator pilot explained, "but Sikyabotoma does." Urgo passed on the datum.

The galactics, including the Pueblo man, formed a semicircle confronting Lindquist. The rest of the village watched aloofly. Klak't'klak lifted one gaunt arm. "Greeting to you, O native," he said in Interlingo-12. "Rest assured that you are *in the grasping organs of civilized* and benevolent entities who intend you no harm; who may, indeed, prove to be the promoters of a benign revolution upon your planet. Whether this eventuality materializes or not is dependent upon my official judgment as to whether a general announcement of the existence of a galaxy-wide Federation of technologically and sociologically advanced races will serve the larger good, including your own good. Hence the outcome is to a small extent dependent upon what you yourself, individually, today, choose to give me in the way of information. May I therefore initially request—request, mind you; we shall not compel you—and advise that you relate to me in circumstantial detail what I wish to be apprised of, beginning with the events which led to your untoward arrival."

"He wants to know how the bum got here," Urgo said in Interlingo-7.

"The honorable envoy of the Federation's guiding council asks what gods led hither the stranger's path," Pazilliwheep said in Hopi.

"The pterodactyl character is a kind of inspector," Sikyabotoma said in English. "He won't hurt you, but he would like to know a few things, like how come you stopped by."

Lindquist took another pull on his bottle. "I . . . I saw the flying saucer . . . and followed it," he whispered.

"Yeah, sure. Look, pal, I don't *believe you can tell him a thing that* I can't. But let's go through with the game and make him happy, O.K.? The other two are plain merchant sailors. Old buddies of mine; I even made a voyage with 'em once, to help establish an outplanet market for our local handicrafts. But Beak-and-Wings, he's come to find out whether the galactics ought to let the rest of Earth know about them; whether they should invite every country to join their Federation. In other words, he's one of those do-gooder types."

"You . . . don't think . . . we should join?" Lindquist got forth.

"Frankly, no." Sikyabotoma shrugged. "Not that this pueblo is selfish, or holds a deep grudge against the white man, or anything. However, you can't expect we'll fall over ourselves to do the white man a favor, can you? Especially when that'd end our own comfortable mo-

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nopoly on trade and services with the galaxy. We're not ostentatious about it, and, of course, we're pretty small potatoes in the Federation . . . but you'd be surprised at some of the stuff we keep in our adobes."

Lindquist braced himself. "*I* look at the matter differently," he said. "Can I trust you to give him my side of the story?"

"Sure. I may be prejudiced, but I'm honest. Besides, he figures to study the whole planet. Don't loft your hopes, though. One dollar gets you ten that he turns thumbs down."

"How can he?" Lindquist cried.

Sikyabotoma looked closer. "I'll be damned, you're right. He has thumbs on both sides of his palms . . . Oh. You mean how can he refuse the U.S.A., and the U.S.S.R., and France, and Britain, and China, and— Well, it's easy. They haven't anything unique to offer. Not in a galaxy loaded with civilizations. All that Wuwucimti has, really, is a convenient location, and people who don't swarm over every ship that lands, stealing things and asking stupid questions. You start letting in the riffraff, and first you've got to disestablish institutions like war, and then you've got to give them technical assistance, and then— Anyhow, it's a mess. That's why secrecy is preserved, you know. If you guys ever found out the truth, collectively, you'd have to be invited to join. Otherwise, the do-gooders say, your precious little egos would be so bruised that what culture you have would fall to pieces." The Hopi checked himself. "Sorry. I didn't mean to sound smug. Or malicious. It's just the way the ball bounces."

"How about my ego?" Lindquist demanded, close to tears.

Sikyabotoma patted his shoulder. "Nothing personal, Charlie," he said. "Individual humans who got interviewed in the past don't seem to've suffered harm. Look at it this way: you won't be any worse off than you were. Huh?"

"I'll tell the world!" Lindquist said furiously. "I'll call in the F.B.I., the news reporters, the—"

"For both our sakes," the Indian answered, "I wish you wouldn't. You'd only make a fool of yourself. At most, you'd bring in somebody else, and the village 'ud have to go through the same old cover up as before. You wouldn't do that to us, would you, now? A nice guy like you?"

"No, I'll keep watch—" Lindquist snapped his mouth shut.

"Till another ship arrives, eh?" Sikyabotoma chuckled. "You'd wait a mighty long time, podner."

"Not many come?"

"Well, it varies. With thousands of shipping outfits plying these lanes, we can expect several craft per year to stop by, though we never know in advance. However, what we do know is if anybody's within twenty-thirty miles. A little gadget that detects thoughts. So you can't monitor us unbeknownst. We

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can warn off ships; they do radio us from orbit before landing. Chances are they'd come down anyway, but maintain camouflage. All you'd observe, or photograph, would be a colored blur like ordinary ball lightning. If worst comes to worst, a bunch of us can deal with a spy. Nothing violent, understand. We'll kind of escort him away, no more. If we have to break his camera, we'll pay him full value. You see, we're Federation members, so we live by Federation rules."

The inspector spoke words which went along the chain of interpreters. Sikyabotoma nodded and sat down on his haunches. "You might as well relax," he said. "Over here, in the shade. You're about to be interviewed."

Time passed. Shadows lengthened. The Pueblo women cooked dinner. They brought some to Lindquist. It was Hopi food, based on cornmeal tortillas, but the filling was like nothing on Earth. Quite literally so. Sikyabotoma explained that a lot of interstellar trade was in spices.

When the sun went below the mountains, stars leaped arrogantly forth. Coyotes yipped across a gigantic silence. Lindquist stared heavenward, shivering in the cold.

Sikyabotoma rose, yawning. "That's that," he said. "They'll fly you out now, to make sure you don't hang around. Any special place you'd like to go?"

"Colorado Springs?" Lindquist faltered.

"I wouldn't. NORAD headquarters, remember. If they spot your plane on their radars without any flight plan filed, they might get a little unpleasant."

"That's my problem." Lindquist could scarcely keep his tone level. He had not dared hope his precarious plan would work to this extent.

"O.K., so 'tis. Hm-m-m, I think I'll ride along. You might enjoy being shown around a genuine hypership. Something to tell your grandchildren, if you don't mind 'em thinking you're an awful liar."

The three aliens embarked. Lindquist and Sikyabotoma followed, after the village elders had bidden the former good-bye with every ritual courtesy. A larger opening gaped elsewhere in the hull; the aircraft rose on some silent, invisible beam of force; it was stowed aboard. The great ship closed herself. Soundlessly, but swathed again in rainbow haze, she lifted and swung north.

Inside, she was less impressive. In fact, she was grimy, battered, noisy, and ill-smelling. Sikyabotoma shrugged when Lindquist dared remark on it. "So what do you expect in an old tramp with cheapskate owners? Red plush toilet seats? C'mon, we better stash you in your plane. Be over Pike's Peak soon."

When Lindquist was harnessed, the Hopi stuck a hand through the open cabin door of the aircraft. His brown face was bent in a wry

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smile. "Shake," he offered. "I hope there aren't any hard feelings. You're a right guy. I could damn near wish Birdbrain does certify this whole planet for membership. But I know he won't. So long, Charlie, and good luck to you."

He closed the door. For a minute Lindquist sat alone, in the thrumming, coldly lit cavern of the hold. The hull opened. Stars glittered in the aperture, brilliant against crystalline black. Air puffed outward, popping his eardrums, and cold flowed inward. He started his engine. But it was the impalpable force beam that carried him forth and released him.

Town lights glittered far beneath. The spaceship hovered close, like a swirling, shifting, many-hued light-fog. She departed, gathering speed until no human-built rocket could have paced her. Night swallowed the vision.

Lindquist shuddered. His radio earphones squawked with challenge. An interceptor jet winged toward him. "Sure," he said. "I'll come down. Any place you want." Excitement torrented through him. "And then . . . take me to your leader!"

In the morning they turned him over to Lieutenant Harold Quimby. Maybe that press officer could get rid of him.

Sunlight slanted through a window, beyond which stretched the neat buildings and walked the neat personnel of a United States Air Force base. Light glowed on immaculate office furniture, on Quimby's polished insignia and practiced toothpaste smile. Lindquist grew doubly aware of how unshaven, sweaty, and haggard he was. His eyes burned; the lids felt like sandpaper.

"Cigarette?" Quimby invited. "Coffee?"

"No," Lindquist grated. "Some common sense. That's all I ask. The common sense and common decency of listening to me."

"Why, surely our people—"

"Yeah, they grilled me. For most of the night. Oh, polite enough. But they kept after me and after me."

"Well, you must realize, Mr. Lindquist, when you suddenly appear over a sensitive area like this, you must expect that men charged with the national defense will ask for details."

"Damn it, I *gave* them details! Every last stinking detail I could dredge up. Look, the fact that I did appear, without your fool radars registering me till I was there . . . doesn't that mean anything?"

"It means that the plasmoid blanketed your approach. Not unknown. An unusually fine plasmoid, wasn't it?" Quimby leaned forward with a sympathetic air. "I can easily understand why you would follow such a beautiful and fascinating object. And, ah, how the interplay of colors . . . hypnotic, even epileptogenic effects . . . mistaking a vivid dream for reality— No, wait!" He

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lifted his hand. "The Air Force is not calling you a lunatic, Mr. Lindquist. What happened to you could happen to anyone. I talked with Major Williams of our psychiatric division before my appointment with you today. He assured me that illusion and confusion are the normal result of lengthy exposure to certain optical phenomena. We lodged you overnight precisely so that our intelligence officers could make a few phone calls, checking on your background and recent activities. I assure you, Mr. Lindquist, we are careful here. We have established that you are sane and well-intentioned. We appreciate the patriotism that led you to seek us out, even in your, ah, slightly delirious condition. You are free to go home, Mr. Lindquist, with the warmest thanks of the United States Air Force." Quimby paused for breath.

"But you saw the spaceship yourselves!" Lindquist groaned. "You radared the thing. You recorded electric and magnetic effects. Your technical man admitted as much to me. How can you call it an illusion?"

"We don't, sir, we don't," Quimby beamed. "It was absolutely real. The Air Force is not dogmatic; also the Air Force has been interested in this subject for many years. When the first so-called 'flying saucer' reports were made in the 1940s, the Air Force mounted its own official investigation. Here"—he handed Lindquist a glossy-paper pamphlet off a stack on his desk—"a brief summary of Project Blue Book. Certain people remained unsatisfied. They charged—quite wrongly, I assure you—distortion and suppression of evidence. Accordingly, to clear its good name, in the late 1960s the Air Force commissioned a new investigation by independent scientific organizations and reputable unaffiliated individuals. An unclassified project, mind you." He gave Lindquist another pamphlet. "Here is a history of that effort. It was crowned by success. Here is a summary of the technical findings. Here is a somewhat more popular account, and here is a reprint of what proved to be the key physical data, and here is a—"

Lindquist slumped. "I know," he said. "They told me last night what they believe. Ball lightning."

"Well, no, not exactly that," Quimby said. "The subject is pretty complicated. Yes, sir, pretty complicated, if I do say so myself. Flying saucer reports had many different sources. Early during the furore, it was shown that most were caused by sightings of weather balloons, or mirages, or reflections, or Venus, or any of several other things. There did remain a certain small percentage which could not be accounted for in that way. But then it was shown—about 1965 or '70, as I recall—that nature can generate plasmoids in the atmosphere. You

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know, traveling masses of ionized gas, held together for a few hours by a kind of self-generated magnetic bottle. Ball lightning is one kind of plasmoid. There are others. Including the kind that shines, produces erratic magnetic and electric fields, reflects radar, shuttles about at incredible speed but with never a sound, and is roughly disk-shaped. In short, the classical flying saucer apparition. This was *proven*, Mr. Lindquist. It was observed, analyzed, and reproduced in the laboratory. By now, any good electrophysicist who wanted to take the trouble could fake his own flying saucer. Here, take this account by the Nobel Prize winner Dr.—"

"Never mind," Lindquist mumbled. "I don't doubt there are natural neon signs zipping around. So the saucerians don't need anything for camouflage except a false one."

"Well, Mr. Lindquist," Quimby replied, the least bit severely, "don't you believe it's high time you looked at the matter like the reasonable man you are? You had a, ah, an involuntary psychedelic experience. You would not have had it if you had known the truth. Then you would have realized there was no point in chasing that plasmoid. Nobody does any more, you know. Because of your, ah, long foreign residence, you weren't kept up to date. But the truth is that the flying-saucer hysteria vanished years ago. Once the clear light of science was thrown on this murky subject, the American people realized that everything had been due to an easily explainable natural phenomenon. They turned their attention to better topics. You won't find anyone any longer who claims that flying saucers are, ah, spaceships crewed by little green men."

"Would you believe a surly blue giant?"

"No, Mr. Lindquist, I would not. Nor, ah, pterodactyls and centaurs with arms on their noses. Least of all that a bunch of poverty-stricken, mostly illiterate Pueblo Indians are —Well, you have a very imaginative subconscious mind, sir, but I'm afraid no one cares to listen. So you had better settle for reality."

Lindquist raised eyes in which hope still struggled with exhaustion. "No one?" he asked. "Absolutely no one in the world?"

"Oh, I suppose a few cranks are left, like in California," Quimby laughed. "People to whom the outer-space-visitors idea became a sort of religion that they still can't bear to give up." His tone sharpened. "It would not be advisable to prey on their gullibility. Not that you would, Mr. Lindquist. But some confidence man who, ah, tried to squeeze a dollar from those poor deluded souls . . . yes, I think the authorities might deal rather harshly with him."

Lindquist rose. "I know when I'm licked," he said bitterly. "I won't take any more of your time."

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"Well, thank you, that's appreciated." Quimby stood, too—with almost indecent haste. "We are rather busy at the moment, preparing press kits about General Robinson's promotion to four-star rank."

Lindquist ignored the proffered hand and shambled toward the door. "Too busy to bring Earth into the Galactic Federation!" he spat.

"That's not the job of the Air Force," Quimby reminded him. "Foreign relations belong to the State Department."

The bar which Lindquist found was noisy with college students. He didn't mind that. For the most part he sat hunched over his beer. When his awareness did, occasionally, return from interstellar immensities—to order more beer—he got a little encouragement from the sight of coeds passing by. A universe which had produced girls couldn't be all bad.

Contrariwise, it must be a hell of a good universe. Rich, wonderful, various, exciting, mind-expanding, soul-uplifting: if only you could get out into it.

"Rats!" Lindquist muttered around his pipestem. "Got to be *some* way to make a buck with what I know."

He wasn't entirely cynical. The galactics were, he thought. They denied to the human race every marvel, opportunity, insight, help, comfort that a millennia-old science must have to give. Not that they were monsters. With—how many suns in the galaxy? A hundred billion? They rated intelligent species at a dime a dozen, and probably this was inevitable. Indeed, it was astonishing how altruistic they were. They could have conquered Earth in an afternoon. But instead, they slunk about in disguise for fear of what the knowledge of their presence might do to men . . . if, following the revelation, they did not promptly act to lift man to their own level.

Sure, you can't blame them. Why should they solve our problems for us? Especially when it'd be a lot of trouble and expense to them. What did we ever do for the galactics?

Lindquist fumed smoke into the racketing, beer-laden air. *That's not the point,* he thought grimly. *The point as far as I'm concerned is that I and my whole ever-lovin' species will keep on being poor, ignorant, war-plagued, tyrannized, restricted, short-lived, and I don't know what else—unless the Federation can be forced to take us in.*

Which it can be, if we the people of the United States learn for sure that the Federation exists.

How? The galactics, including those Injuns, understand how to keep us blindfolded. They didn't even bother to silence me. Who'd listen?

Maybe, momentarily, the chance had existed. In 1950, or whenever the flying saucer craze started, human civilization had advanced to

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the point where it could imagine extraterrestrial visitors; and it had not yet gotten the idea of plasmoids, or rather, it was denying that any such thing could be. So the standard spaceship disguise had been ineffective for a decade or two. Unfortunately, though, no one had happened to catch a sitting spaceship during those years. At least, not enough people had happened to do so, and their unsupported word was insufficient. Now research had established that flying saucers could be plasmoids. Therefore, humankind concluded, they were plasmoids. As the galactics had foreseen.

Today no one would believe the crazy truth. Except maybe some pathetic remnants of the discredited saucer cults. They might. But what could they do, except invite the narrator into their mutual admiration society?

What . . . could . . . they . . . do?

Sean Lindquist leaped to his feet. His table went over, scattering beer and broken glass. His pipe fell to the floor. "Eureka!" he bellowed.

The bartender approached. "You had enough, buster," he said ominously. "Start taking off your clothes and I call a cop."

The Reverend Jaxton Muir, pastor of the First United Church of the Cosmic Brotherhood, was a surprise. Though Lindquist had done considerable research beforehand, he had expected someone more, well, far out. Reverend Muir was soft-spoken, self-contained, and conventionally dressed—for Los Angeles, at least. He lived with his wife in an apartment near the shop that earned him his daily bread. The place could have belonged to any middle-class, middle-aged couple. Only the books were unusual. They formed probably as complete a library of sauceriana as existed anywhere on Earth.

"Please sit down, Mr. Lindquist," he invited. "Would you care for some coffee? Smoke if you wish. It's bad for the health, but until the Elder Brethren see fit to raise us to the next rung of evolution's ladder, we can't much help our frailties. Pardon me. I didn't intend to preach at you. You came to tell me something, not vice versa."

Lindquist wondered what his best gambit was. From what he could learn of the C. B. Church, its few score active members, and its influence on several hundred saucerists of other kinds, he didn't believe that he could be entirely truthful. Muir's credo held that the extraterrestrials were the benevolent, wellnigh omnipotent agents of a civilization which was the chosen instrument of God. That wouldn't fit so well with a rusty old tramp ship, pinchpenny owners, and so forth. Would it?

"I've had an Experience," he said.

"Really?" Muir's tone did not alter. "Do you know, I never have been vouchsafed one. Few who

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were are left alive; and the last confirmed report of a talk with Them was fifteen years ago." His gaze was quite steady. Traffic noises came through the window, to underscore his voice with muted thunder. "Hoaxes are not unheard of."

Lindquist achieved a smile. "You're skeptical, Reverend?"

"Well, let us say I'm open-minded. I've often stated, in sermons and articles, that I think the Elders have abandoned us for a while because we grew too skeptical. They will come back when faith has come back. But—forgive me—there have been deliberate frauds, and there have been far more honest mistakes. For your sake as well as ours, we must sift your story carefully—whatever you tell."

"You're very tactful, sir." Lindquist's lanky frame relaxed in the armchair. As he felt his way into the situation, he gained confidence. "And I might as well confess at the outset, I want money. Furthermore, I haven't a scrap of physical evidence. Only the recent sighting over Colorado Springs, which thousands of people saw." He drew a breath. "However, if I can get financing, your auditors will keep track of every nickel. What we need is to build and transport a certain device which the Elders have described to me. For this, we'll have to buy materials and hire expensive technicians. We'll have to do a little R & D, perhaps, because the Elders didn't give me any blueprint, only a general verbal account. We'll have to do this on the QT until we're ready to roll, or you can imagine what a field day the news media will have."

Muir opened his mouth. Lindquist hurried on:

"In earnest of my sincerity, as well as to help, I can mortgage what little I own and toss several thousand dollars into the kitty. If you can double that, I believe we'll have the necessary. I checked on your people before I phoned you. They're not rich by a long shot. But between your congregation and, uh, its sympathizers—if you launch an appeal yourself—a few dollars contributed per person—the thing can be swung financially without hurting any individual except me if it fails."

He paused. "I do not guarantee success," he finished.

Muir sat quiet for a long time. His eyes never left his visitor. Finally he whispered, "You're not a con artist. You may be a crank, but you're honest. Go on, in God's name."

Lindquist saw tears. However noble his purpose, he felt a touch guilty as he gave his doctored account. The benevolent Elders had returned. They found Earth in dire straits. Disaster was imminent. Yet they could not destroy the human spirit by acting as dictators. They could only work through such persons as had faith in them.

Nor could they linger here. Other

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planets also needed their attention. But if enough humans had faith—if the veritable mustard seed existed upon Earth—then they could manifest themselves at last, and lead mankind to salvation. To this end, let the faithful build a communication device such as they demonstrated and explained to Sean F. X. Lindquist. In time, they would receive its message and they would come.

Did no such call reach them, they would sadly know that man was beyond redemption.

Passing through the ship's observation verandah—an elegant phrase for a crummy little cabin outfitted with an exterior visiscreen and a few seats adjustable to most species—Urgo the Red saw Klak't'klak. The fore the view that slid beneath. The sector inspector stood hunched bescene was of high desert, raw mineral hues under a blazing sun. His winged shape was etched in black by contrast. And yet he looked so frail, bowed, utterly tired and discouraged, that Urgo's equivalent of a heart went out to him. The engineer supercargo had grumbled at length during the past tedious weeks. Nevertheless, against his will, he had come to like the official passenger. It hurt him, now, to see the little Ittatikan stand thus alone. He went and joined him.

"You're really quittin', huh?" he asked inanely.

Klak't'klak uttered a mournful whistle. "Yes. Not that the natives have no potential. They seem about average, insofar as any such concept is meaningful. But I could not justify a recommendation that missions be sent to elevate them."

"Troublemakers. Yeh, I could'a told you that right off," Urgo rumbled.

"No. Not really." Klak't'klak spread his wings and folded them again. "They would not be a detriment to the Federation. But neither would they be an outstanding asset, as far as I can judge on the basis of my examinations. They would, in short, be . . . merely one more member species. Therefore, as long as they remain in happy ignorance of us, I cannot honestly say that the Federation taxpayer should be burdened with the cost of incorporating them. Let them invent the hyperdrive for themselves, in a thousand or two years."

Urgo belched, which out of him corresponded to a sigh of relief. "That's the spirit, Inspector! I knew you'd decide right. But how come are you lookin' so down in the chops you haven't got?"

"I don't rightly know," Klak't'klak said. "Depression, I suppose. So much time, effort, expense, inconveniencing you and Navigator Pilot Finnison—you've been extraordinarily kind, you two, and I won't forget it when I write my official report—but for nothing."

Urgo spread his mighty arms. "Ah, don't worry. The job was a

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drag, sure, but it's over with now. We'll stop off at the pueblo to snatch a rest and some trade goods. Then ho for the Rim!"

At that moment, the buzzer sounded. Pazilliwheep's voice followed. *"Attenta!"* He had amused himself by acquiring a few 143an phrases as *Grumdel Castle* prowled around the globe. *"Pericolo!* All hands to stations!"

"What the blazes?" Urgo was already loping for the engine room. Klak't'klak flapped and hopped toward his quarters, where he would at least be out of the way. You don't argue when someone calls emergency on a hypership. The deck gonged to the engineer supercargo's footfalls. "What's'a matter?" he roared.

"I don't know," Pazilliwheep said tautly over the intercom. "Electromagnetic field . . . variable . . . registered a few seconds ago. Might be a natural plasmoid, but we'd better have a look."

Urgo felt relieved. The news could have been something nasty, like the bottom dropping out of this hull. "Where are we, anyhow?" he asked.

"About fifty miles west of Wuwucimti. Which is to say, the emanations could be from a galactic ship in distress—a little ways beyond mind-detector range from the pueblo." Pazilliwheep swung his craft through a ninety-degree turn. The acceleration compensators were so badly out of phase that Urgo slipped on the deck and hit his nose.

Nevertheless, the engineer supercargo confined his remarks to a muttered *"Snagabagabartbats!"* That was cruel country below, especially for beings who had not evolved on this planet. A vessel grounded helpless in those arid mountains and canyons might soon be crewless. And that—aside from every moral consideration—invited the disaster of discovery by non-Hopi autochthons. It was well that *Grumdel Castle* had happened by in time.

Once in the engine room, Urgo activated his own visiscreen. He saw a wild landscape, heat shimmers and dust devils . . . and, yes, a saucer shape on a small mesa. Its outlines were blurred by a weak camouflage field, and neither he nor Pazilliwheep could identify the make of ship. But with millions of different makes—

"Why aren't they transmitting?" Pazilliwheep wondered.

"Transmitter busted, I guess," Urgo said. "They could'a lain here for, cometfire, days or weeks, you know. Aimin' to land at Wuwucimti but not makin' it. Expectin' somebody else'd come by eventually, and keepin' their field goin' so's they'd be detectable at a distance."

"But not daring to strike out on foot for the pueblo," Pazilliwheep added. "Right you are. Let's get down."

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Grumdel Castle descended to the mesa and cut her own camouflage and her engines. The galactics emerged into brilliant, silent, sagebrush-pungent air. Hulking Urgo, graceful Pazilliwheep, broad-winged Klak't'klak moved across the sand toward the beached hypership.

Only, now that they were close, it looked less and less like a hypership. It looked more like—

"Surprise, surprise!" caroled a native voice. Sean F. X. Lindquist's lean form sprang from the false hull. He ran to meet them, arms spread in welcome, face wide open in a silly grin. "Am I glad to see you! Two weeks waiting! And you turn out to be the very same guys who— Come on and have a cold beer!"

Klak't'klak had brought his translator machine, which was keyed to several Federation as well as 143an languages. But it was his pomander behind which he retreated. His eyes rolled. He gasped. Urgo bawled, "Oh, no!" and Pazilliwheep looked ill.

Other humans emerged. So did a television camera on a dolly. "We alerted the news services," Lindquist said happily. "Of course they thought this was a lunatic-fringe project, but they did agree to stand by, in case we came up with anything good for laughs. Smile, you're on candid camera! Now we better break the news gently to my assistants, that you aren't quite the godlike beings most of them think you are." He stopped, blushed through his stubble, and beckoned to a companion. "Pardon me. I was so excited I forgot. Here's Professor Rostovtsev from Colorado U. He speaks Hopi."

Klak't'klak had already adjusted his machine to English. He turned it off for a minute, while he expressed himself in his own tongue. Then he closed the circuit again.

"Never mind," he said resignedly. "Welcome to the Galactic Federation." ■

(continued from page 99) ence; whichever story gets the most first place votes earns its author encouragement to do it again—encouragement of the kind that counts, because the author can count it!

In the November issue, Guy McCord's story "Coup" came out #1. Here are the ratings; send in your votes this month! ■ *The Editor*

NOVEMBER 1967

PLACE	STORY	AUTHOR	POINTS
1.	Coup	*Guy McCord*	2.18
2.	The Case of the Perjured Planet	*Martin Loran*	2.70
3.	The Cure-All Merchant	*Jack Wodhams*	2.90
4.	Mission: Red Plague	*Joe Poyer*	3.08
5.	Prostho Plus	*Piers Anthony*	4.02

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Some years ago Analog first ran descriptions of the use of dowsing rods for finding buried pipes; we made efforts to get some signs of scientific interest in a remarkable, workable, and inexplicable phenomenon. Scientists quite consistently merely denied it existed.

Marines fighting for their lives in Vietnam, are somewhat less interested in whether a phenomenon is "folklore, mere superstition, pure nonsense!" and vitally interested that it works.

Hence the following item from the October 13, 1967 New York Times, reported by the Times military analyst, Hanson Baldwin:

Dowsers Detect Enemy's Tunnels

Coat Hangers Also Used by Marines to Find Mines

By HANSON W. BALDWIN
Special to The New York Times

CAMP PENDLETON, Calif., Oct. 10 — Coat-hanger dowsers, or divining rods, are being used by Marine Corps engineers here and in Vietnam to detect tunnels, mines and booby traps.

The traditional willow-wand dowser, employed for many centuries in the search for water, has been replaced, in combat use, by ordinary wire coat hangers or welding rods of steel, brass or other metal three-sixteenths of an inch in diameter.

The wires are bent into L shapes and held loosely in both fists. As the operator walks over the ground they spread apart or point to hidden tunnels, mines or other objects.

Some marines here, including returned veterans, say they have had excellent results with the improvised detecting device.

The coat-hanger dowsers, as they are called here, are not included in Marine Corps equipment manuals. But, according to Marine officers, they have been used in Vietnam with marked success in the last year, particularly by engineer units of the First and Third Marine Divisions, which are engaged in mine detection and tunnel destruction.

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Official Marine Corps Photograph

Supplement Other Methods

The dowsers supplement the familiar battery-powered mine detector, a complex device that emits a warning signal when it is passed over a buried metallic object and the hunt-and-probe method — detection with bayonets.

Major Nelson Hardacker, commanding officer of the 13th Engineer Battalion of the Fifth Marine Division, illustrates the uses of the coat-hanger dowser here at Camp Pendleton to Marine replacements bound for Vietnam.

The replacements are not trained in its use, but they witness a demonstration of the device's ability to find a concealed tunnel or cache of arms as part of the instruction along a "Vietnam trail"—a jungle trail in dense undergrowth sown with simulated Vietcong booby traps and laced with hidden tunnels.

Major Hardacker demonstrated the device this morning to a group of Marine officers and enlisted men.

The two thin wires that he held were bent into L shapes. He held the short ends of the L's—about 8 inches long — loosely in his closed fists at chest heights. The long legs of the L's, each about 26 inches, extended for-

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ward from his body, horizontal to the ground and parallel to each other.

Wires Suddenly Spread

As the major walked slowly across the ground, the two wires suddenly spread apart. The ends pointed in opposite directions almost 180 degrees apart.

"There's a tunnel under me and it runs in the direction shown by the wires," Major Hardacker said.

The major demonstrated the device over barbed wire and the wires again spread apart. Over a sloping tunnel, one wire pointed down in the direction of the tunnel slope; over a buried mine, the wires spread apart and pointed down.

A Marine lieutenant colonel who did not know where the tunnels were tried the device and got much the same result.

Another officer said the coat-hanger dowser did not work well for him. "I guess I'm not psychic enough," he said.

This correspondent found a tunnel, previously unknown to him, with the device.

Major Hardacker said that running water, including underground water and sewage pipes, could also be detected.

The history of the coat-hanger dowser dates back more than a year and the idea seems to have originated with Louis J. Matacia of Falls Church, Va., an operations analyst at the Marine Corps Schools at Quantico, Va.

In a letter to the commanding officer of the Ninth Marine Regiment of the Third Marine Division in Vietnam last December, he suggested the use of his method for locating tunnels and other hidden objects, including buried rifles.

Mr. Matacia mentioned tests made at Quantico and at the Marine base at Camp Lejeune, N.C., and described his method, which was similar to the one now used at Camp Pendleton. Despite his demonstrations at Quantico and elsewhere, however, his method has never been officially adopted.

In his letter to the Ninth Marine Regiment, Mr. Matacia said:

"I have talked to physicists in the Defense Department and at Johns Hopkins; neither can tell me why it works. The Intelligence Department at Quantico is trying to find out why it works; they cannot find an answer at all."

Nevertheless, the unofficial use of the device has spread and the Marine engineers here at Camp Pendleton swear by it. They do not know why it works either, but they are convinced that it does.

As one of them said, Secretary of Defense Robert S. McNamara would "certainly approve this gadget as cost-effective."

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The God Pedlars

The problem in dealing with primitives is that their superstitions are far stronger than their logic. So. . .the answer is, obviously. . .

JACK WODHAMS

Illustrated by Kelly Freas

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"That," Siblin said, pointing to the gloomily-dark cavernous construction that housed the bulky, crudely-carved deity Chansanga, "is one no-good god. What does he do for you? Nothing. It's dry and you want rain. So you give him everything and you make sacrifices, and what happens? What response do you get? For his answer your dust gets thicker. What kind of a god is that?"

The chief sat his communolog impassively. The two priests standing at each side of him scowled.

The older priest said, "Chansanga is displeased. The people offend him. Chansanga punishes the people for having broken his laws in secret ways. Chansanga sees all. Chansanga will not be cheated."

"Oh?" Siblin answered. He exuded confidence. "Well, if your useless god doesn't come up with some rain soon, there'll be nobody left for him to be god over. You've hardly enough water left for drinking, let alone to use for crops."

"Chansanga will show the way," the older priest asserted with flashing eye. "He will point to us the path. Beyond the hills lie the Drollorods. Chansanga says that we can return in favor by the drawing of their blood."

"Oh, yeah?" Siblin's expression was not far from a sneer. "The Drollorods have accepted the new god. He is powerful. He spits fire and wisdom. He is the god Dire, giver of all things, bountiful, cunning and all-knowing. He has brought peace and plenty to the Drollorods, as he has brought prosperity to all who have acknowledged his power."

"Chansanga is greater!" the old priest avowed. "Chansanga will save us and guide us!"

Siblin shook his head. "No, he won't. It is the god Dire who will save you. It is the god Dire who is holding back the rain, and he will not release it until you smash Chansanga and place the Hollow of Communication upon the broken pieces."

The younger priest looked glum. The older priest stuck out his lips unprepossessingly. No immediate scornful reply hastened to his lips—the challenge was too formidable.

"Already you must know of the god Dire," Siblin went on. "Already you must have heard rumors of this mighty new god. Whatever you have heard is true. He gives and protects and provides." His eyes half-closed. "If you take him to your hearts, never will you regret. He will not ask a tithe that you cannot afford to give." His shrewd glance flicked between the two priests. "He will need four ministers that one may be on hand at all times to receive any message that he may send. And to the chief of these ministers falls the leading duty of the cyclic ritual. The god Dire recognizes the exacting responsibility of this highest office in his service, and his rewards for faithfulness and fidelity can be most generous."

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This statement retracted the older priest's lips somewhat, and his frown became thoughtful. "These servants the god Dire requires," he said, "who will they be? Will they be outsiders, strangers, perhaps enlisted from among our enemies?"

"No," Siblin said positively. "You will have to provide these servants from your own ranks. The god Dire is a very busy god and does not wish to waste time instructing strangers about local conditions."

"I see." The older priest pondered. "If we, the priests, repudiate Chansanga, would then the god Dire consider us, to employ us in his service?"

Siblin hesitated. "Ah, possibly. If you are prepared to swear an oath of allegiance and perform the act of renunciation with wholehearted sincerity. But," he warned, "the god Dire will detect any falsity and will know of any restraint and withholding. It would be unwise to attempt to gain the power of his support by subterfuge."

"Hm-m-m." The older priest rolled his badge of office between his fingers. It was like a small, intricately-worked double-ended paddle. "I have heard that the god Dire is very fearsome—that he strikes people down in great pain on a whim. That he burns and destroys, even if only slightly angered."

"That is not so," Siblin said firmly. "The god Dire is kindly and forgiving. Only if he is greatly provoked will he unleash his mighty wrath. Those who do not offend him have nothing to fear."

"Ah." The older priest nodded, unconvinced. He was very much worried that he might be too old to learn new tricks. And he was very much afraid of the unknown awful omnipotence of this god who lately had been much spoken of by travelers to the country. The god Dire was holding back the rain. What else might this god do if they refused him?

The older priest bent to whisper into the chief's ear. The chief listened and agreed.

The priest straightened up and the chief raised his hand. "This is a most important matter," the chief said. "We wish to discuss the subject further amongst ourselves, if you please. We will give you your answer tomorrow."

Siblin dropped onto one knee and bowed his head. "It shall be as you wish," he said. "The god Dire has infinite patience."

Siblin then rose, gathered his scintillating robe to his body and, with his flowing headdress curling in weirdly diaphanous folds behind him, jauntily removed himself from the council area.

"How's it coming along, Bonng? You nearly finished?"

"Very nearly." Bonng was using his sticker-and-twirler and putting the finishing touches to the hookup.

"Good," Siblin said. "I've worked the old boy into a nervous sweat,

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and he's just about right for the ceremonial induction therapy. I think a few mild jolts in the lock box and an escaped lick of flame for a taster, and we'll have ourselves one grateful and dedicated manager." He patted Bonng's shoulder. "Beep it when you're ready."

On hands and knees, Siblin then backed out in all humility through the short tunnel that led to the key enclosure of this newly-installed Hollow of Communication.

"You're who?"

There was an unmistakable look of competence about the thickset man. With his cropped gray hair, the assured wariness of his demeanor bespoke long familiarity with meeting the unfamiliar. He pulled out his impressively-much rad-anotated identifier and handed it over to Siblin for inspection. "Hackitt. Major John Delafore Hackitt, D.R.S.O., M.G., F.F.C.S., and Ph.N., investigating agent of the Standards Observation Commission."

"Oh." Siblin fingered the film for a moment, then flicked it under his verifier. It was always wise not to be careless.

"Um-m-m. So you are," he said. "Also representative of the Monopolies Control, Native Defense and Welfare, and the Right To Claims and Territories Board." Siblin sniffed. "Yes. Very interesting. Well," he waved a hand, "won't you sit down? You are alone?"

"Assistance can be very readily called for."

"Ah, yes. Your location will be on record, and your vehicle made alarmingly tamperproof. A very sound idea. In your occupation you can never know what rogues you may bump into. You had no difficulty homing in on a fix to our center, I see?"

"None at all."

"Good. Gods Incorporated has nothing to hide." Siblin went to open the door to the monitoring room. He poked his head inside. "Jamny, can you carry on for an hour or so? I have an important visitor."

The operator looked up. He shrugged. "O.K., Sib. It's pretty quiet at the moment."

"Thanks." Siblin closed the door. He returned to seat himself at a comfortable surveying distance from his freshly arrived official guest. "My stint is about due," he explained. "Even the boss has to do his bit." He coughed. "Now then, Mr. . . . ah, Major, ah . . . Hackitt, what can we do for you? What has brought the modest enterprise of Gods Incorporated to the attention of the S.O.C.?"

"Ah." Hackitt's eyes went watchfully narrow. "There have been complaints from certain quarters. Complaints of illegal conservatism, competitive interference, and the use of force and intimidation, plus excessive profiteering, plus an abuse of acquired power, plus a funda-

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mental misguidance in your firm's motives and concepts. As well as a few other things."

"What? Why, that's fantastic! You can't be serious?"

"I can and am. This is not a casual call. I am armed with the details of several specific acts."

"Oh?" Siblin was merely curious. "And what may these specific acts be?"

Hackitt smiled faintly. "Ah, no," he said. "Later, perhaps. First, I would like to have an on-the-spot definition of the aims and purposes of this organization. Information obtainable elsewhere is rather vague. On its prospectus your company stresses itself as an educational-entertainment facility." He paused expectantly.

"Oh, yes." Siblin stretched his legs. "You can appreciate that we are a young company. Our initial objectives were only tentatively outlined. The realization of our potential had to be learned in the field."

"And these, ah, realizations, have resulted in an expansion not originally anticipated, is that right?"

"More or less," Siblin assented. "In the beginning we sought only to bring music and graduated culture to the peoples of the more backward worlds. By replacing their negative totems with an active advisory source it was hoped to advance such people socially at an improved rate."

"From the reports that I have received, you have succeeded beyond your wildest hopes," Hackitt commented caustically. "It has been alleged that you are guilty of gross exploitation, and that your machinations extend beyond the bounds of a purely business venture and that, if unchecked, your firm threatens to subjugate the whole planet."

"Well, yes," Siblin admitted, "we do seem to be headed that way, although I would argue the charge of gross exploitation. We have a fixed rate of return on production of ten percent. Quite modest really."

"Ten percent, hey? And what do you do to earn that ten percent?"

"We provide the people with a service that they have never known before. An unexcelled service, I might say, and one highly rewarding to semiprimitive people."

"And highly rewarding to you, also."

Siblin spread his hands. "Well, obviously the interest is of benefit to both sides. The more we can improve their standard of living, the higher net gain for all concerned."

"I have hints," Hackitt said meaningly, "that some of the methods used to accomplish satisfactory results include terrorism and violence."

Siblin smiled. "This is purely our own propaganda. The god Dire, which is the one we promote, is pictured to be fierce and all-powerful. The image of harshness is purposely nurtured. These rough people can

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readily understand a ruthless god; a sentimental and idealistic god is beyond their comprehension. So we foster the rumors. And they *are* only rumors. Consuming individuals in flames and stamping whole villages to dust—these are just imaginative figments conjured up to assist our advertising campaign."

"Can you swear that you have caused no physical harm to any of these people?"

"To any serious degree, yes," Siblin said. "Sometimes we may frighten all hell out of a doubting priest, or some particularly recalcitrant character—give them a whiff and a charge, you know—but this is not harmful beyond a little singeing."

Hackitt's eyes opened wide. "You don't think so?"

"Hm-m-m? No. Nearly being got has a salutary effect that lasts a lifetime."

"And you feel that this makes it permissible?" Hackitt said reprovingly.

"Of course. I mean, the whole point of our god Dire is that he works. He's not one of those hole-in-the-corner gods that lets his customers work out the cause *after* the effect. Old Dire comes straight out with it and lays the law down. He doesn't make ambiguous statements that invite widely diverse interpretation. What he says can be easily understood, and what he says goes."

"Yes, I can see that," Hackitt said rather grimly. "It's a case of do it—or else. The implied threat is unmistakable."

"Yes, yes, certainly, but it's necessary. It would be no good giving them a half-hearted god who let them please themselves. They have to have respect for the god's authority, otherwise they wouldn't bother, would they?"

"The impression I am getting is that you are attempting to establish a regime that will rule by fear," Hackitt declared. "This is in direct contravention of the Development of Retarded Societies Act, and totally beyond the limits of the Merchandising and Trade Noninvolvement Clause of the Commercial Enterprises Delineation of Endeavor Bill. It seems to me," he said with blunt directness, "that your purpose is not designed just for financial gain, but to obtain political and spiritualistic ascendency as well."

Siblin scratched his head. "The rule by fear bit is very superficial. Old Dire does a lot for them. They're very lucky people, really. I mean, they have been given a god they can rely on. But as for the all-embracing compass of our field, well"—he pulled on his ear—"we can't very well escape it. I mean, a god is a god, and if he knows his job and gets things done, who needs politicians?"

"Yes, but does he know his job, that's the point?" Hackitt asked. "Who programs him? And who is the adjudicator who can attest that

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the decisions are just and fair? What authority do you think you have to arbitrarily shape the destiny of the people upon this world? You haven't even submitted a framed experimental submission. Have you?"

"Ah, no. Like I said, we're a young company. But now that you mention it, that is something that we might well do. It would meet with sectional opposition of course. Maybe you could help to explain our attitude to the Ways and Means Council."

"Me?" Hackitt's eyebrows arched. "Do you expect me to support your aggrandizement?"

Siblin sighed. "Well, as you can readily grasp, an intelligent god is inevitably called upon to deal with every facet of life. I mean, it's no good having a god who can ominously predict the onslaught of a punishing gale, and yet not be able to settle a minor land dispute between two farmers. A god is a god, and he has to know everything. A god has to be all-embracing, so to speak. The old gods that they had here were useless. Ignoring the mumbo jumbo that is necessary to keep the natives happy, old Dire is doing a terrific job."

"Oh, is he?" Hackitt was skeptical. "You think so, do you?"

"I know so. I cannot think of a better way to link and coordinate every feature of life. As a means for cultivating a stable, economically well-balanced society, and happily, old Dire will take a lot of beating."

"Hm-m-m." Hackitt was far from being persuaded. "Old Dire, as you call him, has all the attributes and appurtenances of a lusting irremovable despot. It is an abandonment of the self-help credo for one of utter dependence."

"Wrong," Siblin corrected quickly. "It is well-advised self-help coming from a source that inspires the utmost confidence. You know yourself that no matter how primitive the intelligent society, they have a distrust of other intelligent creatures. To get these people to build a dam, say, would take weeks of explanation and reasoning by one of the normal advisory teams. Sometimes the objections are insurmountable. But old Dire can say, 'Build a dam here to such-and-such measurements, and get a move on,' and it gets done without question. And, when later the people find that they can use the water for irrigation, they say, 'By the great crumbling moxblox, old Dire's plenty plenty upstairs is savvy.' "

"That's all very well," Hackitt said, "but what guarantee can you give that all the advice given will be felicitous? Apart from the distortion that invariably flaws the performance of those who wield absolute power, you are bound to make blunders. What precautions do you take to minimize your margin of error? To my observation so far you appear to be running this concern with an informality that borders on the slapdash. Control of such a

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dominating factor as you suggest, if allowed at all, could only be permitted if strict rules were conscientiously adhered to. In matters of great local importance, what standards would you apply in your deliberations to ensure at all times the most equitable results?"

"Hey?" Siblin bent his knees and got to his feet. "I can see that you are not too familiar with the god business. Come into the monitoring room and see us in action." He led the way. "You'll be surprised how easy it is to be a god. Not a great deal of intelligence is required really."

Siblin rolled the door back, and stood aside for Hackitt to enter.

Hackitt stepped into the monitoring room and now had a good look about him. Compact computer units to cover a variety of functions lined three walls to form a "U" that was solid from floor to ceiling. It needed no calculation to know that the item storage capacity of the combination was enormous.

The young man, Jamny, looked up at the intrusion, found no interest, and went back to watching the bed of the console, which was a three-meter-by-one slab in the bend of the "U."

"This," Siblin said, "is our nerve center. This, you might say, is Dire, or D.I.R.E., the Diversely Integrated Reaction Extrapolator. As the god Dire he may make mistakes. As the god Dire, nobody nags him if he does. But we do our best to make sure that he makes as few mistakes as possible, because we are proud of him. We think that he's the best god anybody ever had."

Hackitt looked very doubtful. Jamny flicked a switch.

"See that?" Siblin said. "That's a domestic-problem relay. The team upstairs handles them." He looked at the clock. "Get quite a few of those at this time of day. The priests call them in on low priority."

"Domestic problems?"

"Yes. You know, marital difficulties: Does he really love me? Should I or shouldn't I? That kind of thing. Such questions are prevalent in the afternoons." Siblin warmed to his subject. "In the mornings we get most of the major disputes—prepared overnight to be presented with daylight courage. That's when the Hollow itself gets most use. In the evenings we get the more pertinent personal problems, the ones that crop up during the day. They're mostly secondary, but a few do face the person-to-person treatment. At night we get the confessions and thanks. Very touching that, the thanks."

"I can imagine," Hackitt said dryly. "How do you convey your information?"

"Oh, vocally. The words are tone-adjusted to come out the other end with the appropriate solemnity. If the occasion warrants, we can also get mechanical and atmospheric effects, as well as sonic stimulation

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and one or two other things." Siblin turned his face to him. "Haven't you seen one of the god Dire's Hollows of Communication?"

"No, I haven't."

"Ah, well, they're quite clever, really. The Hollow is a compartmented sphere. The outer compartments include the levy assimilators, the priest's special consultation booth, the boomer-and-blaster manifestations outlets, the razzle-dazzle closet, and so forth. But the key compartment is in the center. Reached by a short low tunnel, a person enters on hands and knees into the inner void. It's a small chamber, and light screening and absorption creates total blackness. Here, in his private audience, the person gives voice to his troubles and awaits the answer."

"Psychologically most advantageous," Hackitt noted.

"Yes, isn't it? Excites enough trepidation to eliminate the frivolous."

"I'd rather have thought that it would have excited enough trepidation to put you out of business."

"Ah, yes, but that's where the priests come in, you see. They act as go-betweens and urgers. Helps their prestige no end, and allows them to make a little on the side."

"What about the advice you just said was given to marital problems?"

"The priests call them in from their own box. The god Dire gives them lattitude, see? Encourages them to handle the minor things on their own. We keep tabs on what goes on during the blabbing session. This knowledge can lend a great air of omnipotence to the god Dire's dealings."

"Yes, I suppose it would," Hackitt said.

"All conversations are recorded for retention snipping and filing, and this, too, builds into a useful memory for a god to have."

"You can playback at will and, no doubt, you derive concise character analyses from your eavesdropping?"

"Precisely. Graded playback at the touch of a button."

Hackitt shook his head. "Invasion of privacy. Reprehensible practice at the best of times. No," he sucked in air between his teeth, "it's dangerous. It's too open to abuse. These people are made pawns, can be manipulated, can be made by this means to do practically anything. This god Dire becomes the government, the law, the dictator of the people."

"It eliminates the bureaucracy," Siblin said.

"Maybe, but it also eliminates free speech, free elections and free development."

"Come off it," Siblin answered. "What government doesn't, to one degree or another? Telling people what to do is what government is all about. Even the lowest grade society behaves by rules of one kind or another. There is always the chief.

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Whether the people are contented or distressed depends largely upon whether those at the top are philanthropic or malignant."

"That's just it. What assurance can your firm give that it will always work towards the best interests of the people? Even if your firm's intentions are sound, by what authority can they announce that their determinations are correct?"

"Please, Major Hackitt," Siblin was pained, "you know that that is no argument. As a much-traveled man you will be familiar with all legal forms of government, from the magnanimous to the restrictive. It is the people who attain high office who decide what is right and what is wrong. The good government of a country depends very much indeed upon the breadth, the integrity, and the sensitivity and understanding of those in control. People are governed by people, and there can never be a guarantee that what is done will be right. Right is an abstract concept formed by the conscience in the minds of men, and, therefore, right is a constant variable."

"There are still broad general standards," Hackitt said obstinately, "and laws are clearly framed and can be consulted by the people. Here your, ah . . . do you call them subjects? . . . have no redress whatsoever. With no statutes, and no concretely referable legislation, they have no recourse to appeal. For justice they have to rely entirely upon this newfangled god. No. No, the system is too open to mismanagement."

"We are fully aware that unscrupulous misapplication of power through the god Dire could be very destructive and harmful," Siblin said. "Nevertheless, we think that the god Dire can best be an agent for good in the hands of free enterprise. Political prejudice or religious bias, unlike in other newly opened territories, has small influence here."

"You think that lust for commercial gain is to be preferred to ideological fervor?"

"Yes, we do. Traders have an interest in showing their customers the way to wealth. The better off the people become, the more business a trader can do. The last thing a trader wants is to see his market degenerate."

"Traders can still be driving overlords," Hackitt observed.

"Merchants are peaceful people. And we've improved on the ancient Phoenicians and the Hudson Bay Company. As traders we recognize the pitfalls of greed. Here, we ourselves have halved the twenty percent profit margin permissible in the development of uninformed intelligent species. Run as a business, this is an incentive and a challenge to us. To raise our total profit we have to raise production, which in turn brings greater affluence to the society."

"It *sounds* good—the people becoming the fortunate employees of

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a generous firm—but are they ever going to be allowed to sit on the board?"

"We hope so in time. For minimum friction we adopt the old-style priests into the new method. Some of them are not so good but, as they drop out, personnel will replace them with more promising talent."

"But the priests are only unwitting foremen, aren't they?"

"As schools are built and progress is made, they will gradually become more and more educationally able. Our ultimate aim is to trade with a fully developed people."

"That will probably mean the end of your god Dire."

"Exactly. And then we can raise our profit margin in the normal course of haggling with equals, see?"

"I . . . uh . . ." Hackitt brooded. "Hm-m-m."

"We're long past the archaic idea of worker-employer antipathy and combat. It is sound business to keep the employee contented and happy, and integration by purposeful participation promises cultural advancement at a very satisfying rate. We do not intend to give them everything ready-made. We may jog them a little to start them off, but we hope they might be led to the habit of discovery by themselves. Ideas prompting rather than things, that they might take credit for their own creativity. Ah, there! Jamny, put that one on the speaker."

Jamny, with a pickup in his ear, had been virtually unnoticed as he answered calls and muttered unobtrusively into his throat mike. Now, in response to a flash on his board, he closed his panel to hold-and-auto and flicked the connection to the indicated circuit.

From the speaker came a voice. "Oh, Dire, Great and Mighty! Hear these the words of your humble servant Tsinsugo, your chosen priest at the town of Kasdac. Hear, I beseech you! One comes our chief, Pesgarra, to seek your counsel, O Wise One. Be not harsh to him I beg you, for what he asks he has no knowing. His wish is but to know your desire . . ."

"Do you want visio?" Jamny asked.

"Yes," Siblin said. And to Hackitt, "The priest introduces the person who is about to enter the Hollow. This keeps us au fait about those with whom we are dealing. The priest then goes through an incense-burning ritual of protective propitiation to cover the client, who crawls through the tunnel."

In the center bank a picture panel came on. A man was making his way on all fours towards the thermo!ens. His face was shiny. He seemed to be very nervous.

"This is Pesgarra," Siblin said. "He is a new chief. He is youthfully ambitious and has a desire for conquest."

On screen Pesgarra halted. He crouched down and waited.

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"Give him the sighing presence," Siblin instructed Jamny. To Hackitt he said, "Very little happens spontaneously. We pick up a great many clues which enable us to predict with some accuracy the outcome of certain patterns of thinking. We can thus await most questions with informed anticipation."

Chief Pesgarra licked his lips.

"What's he waiting for?" Hackitt asked.

"He dares not to speak before the god Dire requests. This period is a test of resolve and allows time for think-twice reflection."

Siblin picked up a microphone and squeezed the grip. "Chief Pesgarra, why is it that you trouble me at this hour?"

The man's head jerked. "O Mighty Dire, I . . . I . . ." He dried up, his eyes widely searching the living velvet darkness that enwrapped him.

"You wish to make war on the Chutsin," Siblin said penetratingly. "You still covet Winnesfrere, the chief's daughter, and seek to take her and also her father's house and lands."

Pesgarra gaped.

"Her father refused you and now, proud warrior, you would like my help to destroy the Chutsin so that you, personally, can strut and be a lord. Is that not right?"

Pesgarra swallowed. His eyes rolled, hopelessly seeking.

"Am I not the god of the Chutsin, also?" Siblin queried. "Am I to fight myself? Think you that I wish my people to fight amongst themselves? Think you"—Siblin turned the power on—"that I, the god Dire, cannot do all the killing that is necessary? Would you take away my pleasure?"

Pesgarra gulped. He heard the rumblings of wrath. Shivering, he gingerly began to inch backwards.

"Hold!" Siblin roared. "Have I told you to leave?"

Pesgarra froze. He hunched, his jaw slack, his breathing quick, his eyes skidding. "I am sorry, O Mighty One. I am sorry. I am sorry. I am but mortal and foolish . . ."

"Ah," Siblin said, "that is your first step to wisdom—a knowledge of your own foolishness. Hear then," and he stared at the trembling figure, "and know that the woman Winnesfrere may yet be yours if you but consent to please me and cease the secret manufacture of weapons. The drawing of blood is mine."

Pesgarra nodded spasmodically. "Yes, yes, yes."

"Good," Siblin said. "Now you may leave."

Pesgarra gladly accepted the release and scuttled backwards as fast as he could go.

Siblin made a gesture and Jamny cut the console back to general reception.

"There, you see?" Siblin said. "That should stop one tribal war from breaking out and so prevent a young hothead from getting a num-

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ber of people killed, and all over a woman."

"Hm-m-m." Hackitt cogitated. "You gave it to him a bit strong, didn't you?"

"He needed it. He's just taken over from his father. Wants to prove himself. We'll probably send him on a hardship course later—just as soon as he is happily married and doesn't want to go."

"What about this woman? Doesn't she have a say? Are you going to use your god Dire's influence to force her into marrying him?"

Siblin grinned. "We hear a great many things. As matchmakers we're among the best. The chief, her father, is a stubborn old devil, but a little research has shown that Winnesfrere would not be at all upset by being wedded to young Pesgarra. I tell you, Major, being a god is a very interesting occupation."

"Huh!" Hackitt frowned. "I'm afraid of what will happen if you let it go to your head."

"Ah, yes, we've taken steps about that. To create a balance and deny control to a single pair of hands for any length of time, we propose eventually to have a quarterly staff redistribution and shuffle. At the moment this is limted because we have only this one pilot plant. Even so, we do swap administrative positions. With expansion we could elaborate this, and this would help to give us nonpartisan world coverage."

"All still on the same side."

"Yes, but we don't all think alike. As you can imagine, all our staff are most carefully selected. We want no tub-thumpers or fanatics. Our personnel are required to be reasonably straightforward, sensibly mature and honest people with some sense of humor. Yes, Jamny, let us have that one."

Jamny obligingly put the latest call on the speaker.

". . . And Mighty! Hear these the words of your . . . cr'm . . . humble slave Drunt . . . c'ha . . . your priest in the . . . ah . . . town of Fleckcha. Our chief, he . . . would speak . . . ah ah . . . with you . . ."

"Visio," Siblin said. To Hackitt, "He's new and nervous. The god Dire was only installed yesterday, and he's not too sure of the routine. Ah!"

A man on his hands and knees moved cautiously forward to fill the viewing screen. He was sweating profusely and did not look at all happy.

"A little soother, Jamny," Siblin said, picking up the mike. "Mm-m-m . . . mm-n-n," Siblin said softly, so that he might not startle with vocal abruptness, "the good chief, Vaccoral, the god Dire welcomes you. The god Dire will assist you and be your friend, as you are worthy of him, and are worthy of your people, and are worthy within your own eyes. Speak, that I may know that which concerns your mind."

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The speech did nothing to lessen Vaccoral's palsy. "Great and Mighty Dire," he faltered, "the . . . the land does thirst and the . . . the . . . there is great need for . . . for water. We need rain . . . Mighty One. . ."

"I know it is rain that you need, and I have prepared. Tonight shall rain fall upon you, and so as you pay heed to my words, so shall you never want for water ever again. It is my gift."

Vaccoral put on a sick smile. This was all that he desired to know. Now all he wanted was to be allowed to get the hell out of there.

"You please me," Siblin said. "Be not afraid to consult with me upon matters that cause you distress. Good chief Vaccoral, you may leave now."

Vastly relieved to find himself still in one piece, the chief retired with pleasure and with what haste decorum would permit.

"There," Siblin said, turning the works back to Jamny, "is the latest addition to our happy band."

Hackitt's head was bobbing. "Your Hollows of Communication are simply weather-arrangers."

"Not simply. They are modified weather-arrangers with quite a few additions. Apart from the humidi-tractors and repulsors, and ripple-wave gale-breakers and so forth, we have a staticatto for high-energy manifestations, and a whirlette spinner that can be guided to perform small-scale wrecking demonstrations. Can create quite an impression."

"I can believe it," Hackitt said soberly.

"Actually it was the weather-arranger that gave rise to the whole god idea. Economically of benefit to the whole community, their introduction as gods was considered the simplest and most feasible approach."

"Hm-m-m. So what's-his-name will get rain tonight?"

"Their weather will improve enormously."

"Yes." Hackitt folded his arms. "Why do you get the chiefs to ask and not the priests? Participation value?"

"That's right. Plus it cuts out the middleman and saves us from dealing with garbled, retouched, or misinterpreted requests. After initiation the priests are more or less forbidden to enter the Hollow. The Hollow is reserved for dignitaries or people with pertinently specific problems that the priests are not knowledgeable enough to handle."

"And you feel that your organization *is* knowledgeable enough to handle such problems?"

"We are certainly better equipped."

Hackitt undid his arms to get a hand to use to rub his chin. "I don't know. I just don't know."

"I do," Siblin said. "We are bringing them progress in its most easily digestible form. Medically we have

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helped them a great deal, although we've met difficulty in the conveying of diagnoses and treatment. It is in distribution and trade that we are strongest. As our network grows, commodity supply and demand can be mated to ensure the least possible waste. As a market guide to what to sell and buy, and where, we are virtually infallible, and we can fix fair prices to suit everybody. In fact, with good management and planting advice regarding nature and quantity of crop, agricultural stability will soon permit us to suggest a broadening of the few industries and encourage an expansion and increase in the range of manufactures."

"But, while you promote the desirable, you still intend to retain the weapon of fear," Hackitt stated. "This I do not care for."

"This, we hope, will be a dwindling factor. With the hard rugged life that the people have led hitherto, fear is an essential feature in their lives. The god Dire cannot be feared less than anything else. At this stage, an occasional burning man helps to keep them on the right path."

Another indicator ticked on the board. Jamny quizzed Siblin with a raised eyebrow. Siblin checked, and made negative motions. Jamny grinned.

"Who was that?" Hackitt asked.

"It's an old chief from one of the first towns we got into. Old Shugbac, right, Jamny?"

Jamny, listening, just nodded.

"He gets into the Hollow every so often and just talks. Quite intelligently. Thinking out loud. He's one of those who enjoy the private mystery of communing. It does him a power of good. We just put in a word here and there. See? Jamny's switched him through to the upstairs team."

"How many do you have upstairs? Do they work on their own initiative?"

"More or less. The four of them help each other."

"What happens if too many calls come in at once?"

"We hold them, record them, or 'go to sleep' on automatic. The 'Do not disturb' notice disturbs the customers who think that maybe the god Dire has gone out personally to appraise their particular problem. We *are* reaching saturation point in this area, though."

"That means that you hope to bring in more teams in the future?"

"Well, that rather depends on you now."

A girl with very round eyes and creamy-white hair appeared in the monitoring-room doorway. "My Mez, I have brought coffee."

Siblin turned. "Oh good, Poco. We could just about do with one, eh, Major?"

"Ah." Hackitt let his eyes rove around the room once more, then he followed Siblin out.

"Who's she?" Hackitt said.

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"One of the locals," Siblin said. For the first time he seemed a little embarrassed. "Attractive, isn't she? I, c'hm, ah . . . When we first arrived we, ah, tended to overdo it a little and, ah, well, the natives were going to kill her. Sacrifice, you know. They nearly did, too. Lucky we were able to persuade them to put her in the assimilator box, where we, ah, swallowed her to rather good effect. Sugar?"

"Uh? No, thanks."

"We couldn't very well send her back, could we? So, ah," Siblin sniffed, "she, ah, became my, um, responsibility. The flicar picked her up that night like a normal collection and, ah, well . . . here she is."

Hackitt viewed Poco with some appreciation. She made him feel a lot younger. She smiled sweetly.

"Hah, yes." Hackitt helped himself to cream. "Er, you were saying something about a burning man?"

"Hm-m-m? Oh yes. Wilder's illusion. Evening time is best. A strange man, in full view, is enveloped by roaring flames. His screams are of searing excruciating agony and prolonged enough for the enjoyment of all. Blazing from head to toe he is drawn irresistibly backwards into the god Dire's shrine, where he disappears, leaving behind only an unpleasantly tainted smoke.

"The god Dire later explains with relish that the man was a spy or some such undesirable. The message is readily apprehended. Would you like a cookie?"

"Uh, thanks." Hackitt took a cookie from the proffered dish. He munched, puzzling. "You don't actually *do* anything that is painful or destructive?"

"Of course not," Siblin said. "It's all just one great convincing bluff. Mind you, we issue warnings where we can take the credit for earthquakes and suchlike natural disasters. We evacuated a town just before the volcano Oskre blew recently. It was easy to relate the erasing of the town to a punitive measure."

Hackitt sipped his coffee. "It's the idea of constant threat that bothers me. It doesn't seem right."

"It's an adaptation to circumstances. We will grow out of it. But to start off it is no good using half-measures. They expect a god to be powerful and cruel. It's what they're used to. We feel that it is better for them to have an apparently wildly bloodthirsty god who actually wreaks no personal vengeance at all, than for them to have a useless god whose ugly silence is so often homicidally interpreted."

Hackitt put his cup down. He rubbed his nose. "I can see that the scheme has a certain merit, but . . . but the hinge, the vital key, lies in the probity and honest sincerity of its administrators. How can you *ever* be sure that somewhere in your organization a lust for power will not get out of hand?"

"We can never be sure, of

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course," Siblin admitted. "The redistribution of posts, the maximum spreading of duties, and the general discussion over the knottier problems to discover the most human answer, these all help to undermine the godlike feeling. Most important, though, is the selection of personnel, and especially of the area director. The director must be very carefully vetted to ensure that he is sensitive, humane, and fully alive to the risks involved. A director who had any tendency at all towards megalomania would be a catastrophe."

Hackitt gave a grim smile. "I can see that."

Siblin started to pour himself another cup of coffee. "Now your boss, Austin G. McRedler, Coordinator General of S.O.C. and related institutions, has sent you along to check upon me. A double check really, for I, too, will be sending him a report," Siblin said, "and my report will be upon you. More coffee?"

"Me?" Hackitt held out his cup.

"Yes, you," Siblin said, tipping the jug. "You see A. G. Mac has a large interest in Gods Incorporated, and he is always on the look out to recruit good material. I outrank you, you know. I am Vice Admiral Mezzrow Siblin, actively retired. Now you," Siblin passed Hackitt the cream, "are due shortly to retire under the rotation system. We thought that a man of your wide experience and knowledge could possibly make a very fine area director indeed. I am glad to tell you that my report will be favorable. You have shown a very keen awareness of the snares latent in this business, and you have displayed a commendable attitude of guarded restraint. Another cookie?"

Hackitt took another cookie.

"I, personally, think that you would be ideal," Siblin said. "We would like to open up the southern area some time next year. There's a glorious mountain site there that is already revered as a kind of Olympus." Poco put a hand on his shoulder and he took her fingers. "I'd be pleased to have you to exchange ideas with. You'd soon get the hang of it. Other people's problems are rarely as difficult as our own. You'd find it extremely interesting. It's a five-day week, a three-shift fourteen-hour day. Not too strenuous. The god Dire closes down from midnight to 10:00 a.m., except for emergencies, and takes the two locally busiest days of the week to go roaming around and, particularly, to see if any funny business is going on. We feel that this helps to improve rectitude in public transactions.

"You'd be surprised at the variety of notions that occur. As for salary, the basic start is adequate, with a profit margin incentive that is graded to inhibit a too-rapid growth. The living conditions are good, and . . ."

Siblin rambled on, outlining the

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details. Hackitt listened, mutely musing, and absently allowing his cookie crumbs to fall into his coffee.

They were seated in a half circle before him—the chief, his son, and the glittering-eyed medicine man and his two assistants.

"The god Dire will bring you prosperity. With the god Dire you will flourish. The god Dire will help protect you from your enemies. The god Dire will hold back the rain that the floods may not wash your chomchuks away. He will control the winds and the waters that your chomchuks may feed on rich pastures and, when the time comes for shedding, the skins that they cast will be thicker and more supple."

The medicine man squinted suspiciously. "Our god Tung-hullah is also powerful. Will this god Dire protect us from his rage?"

"The god Tung-hullah is already broken," Hackitt said derisively. "See? Today the god Dire has let me bring the sun to you. The sun you shall have for one week, let Tung-hullah hide its face if he can. After this time, if you still refuse him, then shall the god Dire torment you with torrents and lightnings and the lashings of his mighty breath . . ."

Hackitt was enjoying himself. Why, he thought, he'd have these natives playing with steam engines in no time. ■

Cover Shots Available

Some of the specially printed cover pictures are still available at $1.50 each. The earlier ones are all sold out, but the August 1967 ("Starfog," by Chesley Bonestell, for the Poul Anderson story) and the Centaur Blowup cover, January 1968 are available in limited numbers.

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had left a giddy gadget indeed
at the Optimum Pass;
it made you what you ought to be—
whether you thought so or not!

W. MACFARLANE
Illustrated by Leo Summers

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The great cube ship honked twice and went null. It drifted up from the planet retracting its leveling jacks, gravitated and was gone. Squinting in the bright sun, Day Layard watched it go. It was always a desolate feeling to be left on a strange world. He felt small and lost, though there were over a hundred men and women near him in the deep grass. It looked more like grass than anything else. It came to his waist in crowded finger-thick stalks, and tiny round leaves grew in rows down the stalks.

"Marching ever onward, the brave explorers faced the unknown to conquer yet another planet for mankind. Tum-de-dum," said the fat man beside him. "Boondocker, you want to take that bunch to the right? I'll march onward and ask the others." Layard grinned. With a job to do, his feeling of desolation evaporated.

"Morning," he said to a man with red-rimmed watery eyes. "Got your map handy?"

"I know they tut-told us, but I don't understand wup-what they want us to do."

"All right, the red circle on the air photo shows where we are now, and your direction needle points to your hut."

"But it sus-seems so foolish." He snapped a stalk of grass nervously between his fingers. "What up-pups the idea? I know they said choose between Space Services and Rebubil-bubul—"

"What's this map stuff and walking?" complained an overblown woman with a raucous voice. "If they want us there, why don't they take us there? You with the long legs and big ears, tell me that. Go on now, speak right up."

Layard told her that after Scouts found a planet and Explorers looked it over, the most economical method of establishing its suitability for human habitation was to have some people live on it for a while. All criminals had a choice between Psychological Rehabilitation and Space Services. They had been landed on this grassy savannah and it was their business to reach their own particular pickup huts within thirty local days. The huts were spotted at about fourteen days of easy march away.

"What a dirty, stinking thing to do!" said the woman. "This is a crime against humanity. Doesn't anybody know about this? Doesn't anybody care what happens to us, even a little?"

"No," said Layard. "Let's see your maps, all of you."

He had just finished marking the hut locations when a woman screamed. She was struggling all by herself. The people around her looked frightened and moved away. Her checkered hair tossed wildly as she screamed again. A stalk of grass had wound around one leg and around her waist two or three times, and the tip looped around an arm and pulled it tight to her body.

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Layard ran to her through the crackling grass, grabbed the stalk in his mittened hands and yanked. It came out of the ground with some reluctance and kept coming. The girl went on screaming, Layard went on pulling. He had pulled up ten meters of writhing green stalk when it tightened around his feet and tumbled him ingloriously to the ground. Then he grabbed a double handful and began shooting poison beads into it. The stalk became spastic. When it went limp, he disentangled himself and stood up.

The fat man slipped his pistol into the clip at the side of his suit and dropped the length of stalk he had been shooting. "Boondocker, I don't know how the specialists clue the poison to the planet, but they do a good job."

Layard helped the girl to her feet. Her checkered hair fell into place, red and black, brown and gold. She was breathing heavily and clung to him. Her hands crept to his neck and she bent his head down and kissed him. His eyes had been narrowed against the bright sun and now they opened wide.

"Like clams dropped into hot coals," said the fat man. He was pulling meter after meter of green stalk out of the ground. "Pressure welding is a basic human technology," he added, though the words were meaningless to Layard's ears.

There was a tippity-tap all over his back and Layard turned to see a man emptying a string of beads at him, a ferocious scowl on his handsome face. "Let go of her!" shouted the man as he fumbled another string of poison beads into his gun. The girl kissed him again and Layard stood as if he had in fact been paralyzed. She knew what she was doing, and did it well. His eyes closed and he was oblivious to the world until there was a hand on his shoulder and a jarring blow to his jaw that knocked him to the ground.

"Oh, Amory, don't!" cried the girl. "You're just jelly. Stop!"

Layard rolled, but not soon enough to avoid a kick in the short ribs. He got to his feet crouching, but no action on his part was necessary. The fat man had a loop of stalk around Amory's throat from the rear, he had him bent back and was picking out a pattern at the base of his neck with a knifepoint, leaving little dots of blood.

"You'll strangle him," observed Layard.

"I'll rehabilitate him right now. Want a kick?"

"Oh, I don't think so." He rubbed his head. "He ran away when she was in trouble. Being a coward and being stupid . . . well, being him ought to be punishment enough."

"A very mature viewpoint." The fat man cast loose the stalk. He stepped back and gave Amory a hearty boot that sent him flopping into the grass like a rag doll.

"You fiend!" screamed the girl. "What have you done?"

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"I got his attention," sighed the fat man. He was coiling the stalk like a rope over his arm. "And then I drove the lesson home. Come on, Boondocker. It's sorry clowns like this that give new planets a bad reputation."

Layard wanted to stay with the checkerheaded girl. With luck she might go hysterical again with him near, but the fat man led him away. They headed across the savannah and up a steep slope of shorter grass, stubby trees and an occasional rock outcrop. The fat man fired his pistol at a shelving rock as a habitual precaution against an unlikely silicon life form, and they sat down together. Layard took the analog food mill from his pack and began pushing the stalk into the grid.

"A camouflaged contractable beast, well-well," said the fat man. He set up his food mill and fed the other end into it. "It's thickened and it still has two meters of mouth. Or is it extensible? This is an odd one, whatever flavor you dial it."

Layard broke a few small branches off a tree and found he could not break the larger ones. He pushed the vegetation into the mill and noted that it produced a good percentage of food. The extruded paste contained analog proteins, fats, sugars and starches and had the texture of fine damp sawdust. Layard had cracked the seal of his air-adsorption canteen when they sat down, and after eating and drinking he tightened it again, with the reluctance of an experienced traveler to carry more weight than necessary. He pulled the hood over his head and it polarized the bright sunlight to a more comfortable intensity. They sat on a stairstep, a low bench of the mountain that towered in ramparts behind them. Directly below was the landing point in the center of a wide peninsula, with the sea perhaps thirty kilometers away on either side. Beyond a long stretch of gently rolling country was a precipitous upthrust of mountains that ran from shore to shore. Beyond those mountains were the huts, the pickup points thirty days from today.

"Nothing much over there," said the fat man. "Let's climb that mountain behind us and look around."

Layard nodded. It was off the map, but the march to the huts looked easy and there were no particular points of interest on the way. "Ho," said Layard, "I've been meaning to ask, but we've been a little busy. Did you have any trouble getting into jail?"

"Did I not! They wouldn't let me in, so I began to steal things. It was embarrassing. I didn't know where to put all that stuff. Then it got more ridiculous because they kept counseling me to overcome my kleptomania and go straight. I deplore this lax attitude. I could always count on the law before." The

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fat man snorted. "I pushed an administrator into a fountain before they finally let me in."

"I made some alcohol and stole a car and ran it into a statue. I had to research the safety devices before I could override them. It's not easy to be a criminal anymore."

"You're right. I think some under-employed computer-happy administrator set up a search for anomalies, and there we stood. Maybe we were overexuberant when we lined up those huts in the shape of an arrow four-five worlds back. They don't want the Prodromals pointed out." He stood up and shrugged into his pack. All his movements were quick and economical. He studied the terrain ahead, the topographical logic of crests and passes. "Boondocker, we've got to take the utmost care. We'd better creep like mice and call no attention to ourselves." He caught Layard's glance at his waistline. "Like stylish-stout mice? Heek-keek-keek!"

They spent the night in a grove of shaggy dwarf trees well up the mountain. The ground was littered with diamond-shaped chips of bark. While an all-weather suit is an admirable garment, it in no way softens the ground, but Layard slept well enough until there was a tug at his ankle. He woke completely when a set of teeth began to gnaw. He twisted his firetube wide open and shot a long snouted creature by its light. The thing jumped into the air, did a somersault and thumped twice. Layard rubbed his bruised ankle. "This place is just a little aggressive," he said when his heart stopped pounding.

"The weather's not all it might be, either." Fog had condensed on the leaves and there were irregular showers whenever the wind blew harder. The fat man dragged the animal to the firetube. "Ho!" he said, "this was an expansible beast. It was bigger than you and now it's shrinking, and I don't think it's because of the rain. Hoo-ha. We don't have to look for food, it comes to us. We must be pretty good bait."

By morning the creature had shrunk to a quarter of its original size and it supplied them with food for the two full days they were fogbound. The wind changed and they woke to a scoured sky and a sparkling land.

On top of the mountain they found themselves at the center of a handshaped promontory with a thumb and three fingers running far into the sea. Their landing place was on the wrist of the hand, and in that direction was an arm of land that led to an indistinct blue-gray land mass on the far horizon.

"All kinds of prominent terrain features!" said Layard. He was delighted. The Prodromals, the forerunners of mankind into space, had sited their enigmatic structures in easily identifiable geographic locations, and a peninsula in the shape

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of an arm, wrist and hand was promising. "Where shall we go first?"

"The base of the thumb. For no particular reason. You've got to go some place first. Boondocker, stop prancing! Sit down. Just because plans don't always work out is no reason for not making them. You always want to look at the obvious before it turns around and bites you. Things happen, but only because I can't help it. Stop laughing. I'm a coward and a damn fool, but a careful damn fool and that's why I'm here after eighty-something planets."

"Why not run down the hill and take a look at that place?"

"We'll walk down the hill and look at them all. Sit down, you fuzzy innocent! Look at what you see. It's forty kilometers to the base of the thumb and another eighty to the tip of the thumbnail. You're an eager, anachronistic walking fool, but twenty-seven days from now is pickup."

They reached the hollow of the thumb as the last light faded from the sky and slept turnabout that night with a fire of driftwood. For two days they followed the long yellow beaches with the surf grumbling beside them before they reached the end of the promontory. The return down the other side of the peninsula took two days longer as they scrambled over rocks and around cliffs and inlets. It was their tenth day on the planet when they reached the bottom of the bay between the thumb and first finger. They had seen nothing but the wildest kind of empty land with no sign of artificial constructions. The wrack on the beaches had been entirely natural.

"I feel time breathing down my neck," said the fat man. "Counting the rest of today, we have twenty days until pickup. And the native life gets curiouser. Look at that sandhog we shot this morning. Sixty centimeters long and skinny for all the feet it had, and it weighed twenty kilos. After we shot it, it expanded. And those arrowbirds. We've seen them wheeling in flocks of a hundred, but I still don't believe they can fly."

"You think Space Services is going to settle this planet?"

The fat man began to draw on the sand with his finger. "I hate adventures. They're dangerous and unnecessary and uncomfortable. You can get hurt. I don't know what Space Services is going to do. I think yes, because the walk from the drop to the huts looked easy and all those unfortunate people ought to make it. And we better make it, too. I got left once. I had to wait about a year on Gunderson. It was lonely."

"If I were a Prodromal," said Layard, "I'd do my building at the end of that first finger. I've really got a feeling there's something there."

"Adventurer," said the fat man

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sadly. "All right. I have the same sort of idiotic hunch about the second finger. Hoo-ha," he sighed, "what flavor did you pick out for the sandhog?"

"I dialed them all," said Layard, and they ate before they parted.

This was Layard's fifth world and he regarded himself as an experienced traveler. He was just under twenty-three subjective years old and a lean and rangy man. His long legs ate the kilometers and he walked from first to last light. He reached the end of the peninsula on the third day and felt triumphant in his youth and strength. There was no sign of the Prodromals. It took him seven days to make the trip back. For two days the fog was so thick that it was impossible to move. He proved this the hard way. He tried to negotiate a rocky point and was nearly drowned in the battering surf. Then he fell three meters onto a pile of broadleaf seaweed and twisted a shoulder. It finally occurred to him that he couldn't see a Prodromal artifact unless he ran into it, so he found what shelter he could on the lee side of a rock and waited impatiently for the weather to clear. It was a beautiful windy day when he stumbled onto an arrowbird rookery and learned a great deal more about the creatures than he ever wanted to know.

Arrowbirds exhibited all the ambiguous characteristics of the planet. Delta winged, they increased their bulk to fly, and condensed and elongated when they split the water to spear fish. The edges of their wings were incredibly thin, sharp scales. They were blocky on land to withstand the high wind that blew away the fog, and they were aggressive beyond reason when their scaleless young seemed threatened. Layard found a piece of driftwood and batted at the first few that zoomed in on him. He caught one squarely and the creature split the branch like an ax. He attempted a water passage and hid between some offshore rocks after the first dive bombing. He made his way to land during the night and discovered that arrowbirds were double-gaited, diurnal and nocturnal, and just as hostile either way. He wove a protective cage from seaweed stalks so stiff he could hardly work them and when he raised it above his rock cleft, their wing edges sliced it like a knife through analog paste. They enjoyed diving through the smoke of the fire he built. It took three wracking days to crawl from rock to rock out of range, and even then he had to keep a wary eye open for an occasional bird who was sorry to see him get away. When he reached the base of the peninsula, the fat man was not there, nor were there any signs that he had ever been there.

Ten days to pickup. The analog food clung to the roof of his mouth. All the flavors of the air-adsorption canteen were weary to his palate.

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The all-weather suit was cut by the arrowbirds and functioned imperfectly. Worst of all was the dreadful suspicion that the fat man had deserted him. Ten days.

He found himself arguing aloud and because he was young this embarrassed him, and he fell silent. His mind was made up. Any world is a big and lonely place, and he was a small and mortal man. The only reasonable thing to do was head for the huts. The fat man was probably lying on a soft pad right now, watching an entertainment tape, laughing at him.

"Hoo-ha!" said Layard, and started walking. He started walking across the base of the second finger to find the fat man, and just before sunset he cut a trail going the way he had come. He turned and loped along it. In sight of the bay again, he found the fat man slumped against a rock.

"Arrowbirds?" asked Layard. "They eat poison beads like candy."

The fat man closed his eyes and

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opened them again. "I found a carapace on the beach. Big enough to get under. Crawled right through them. You remember that thing with the long snoot that chewed on your leg? I met him condensed. Harder and tougher. Stuck my hand near a hole in the rock. Crunk. He got it. I shot him. Felt kind of queasy when I tied off the stump and seared it and ran him through the mill. I was pretty hungry. Think it's cannibalism?"

Layard swollowed hard and ignored this complex question. "How do you feel?"

The fat man's eyes crinkled. "I hoped you would ask that." He seemed genuinely amused. He made a fist and stretched his fingers. "With one hand."

The next morning they began a nightmare journey. The fat man was weak from shock and loss of blood, Layard was hollow-eyed from lack of sleep and the burden of responsibility he kept to himself. Ten days until pickup and a weary long way to go. He did not realize how heavily this weighed on him until the fat man suggested he go ahead and bring back help. His heart lifted in lunatic temptation and then he said, "Space Services counts bodies out and bodies in. That's how they keep score and you know it."

They found that a poultice from the food mill eased the suppurating stump, but walking all day was poor post-operative treatment. The pain was constant and hellish when he jarred it, but the fat man said his missing hand itched and he could think of no way to scratch it.

They were forced upstream out of their line of march to cross a tumultuous river and floundered into an area of upland cienegas that cost them priceless time to cross. They plodded through one day of dull driving rain. The water ran into Layard's suit through the rips the arrowbirds cut and ran out a hole above his left ankle and out a jagged tear at his right knee. From time to time he would sit with his feet uphill and let the water run out through the larger holes. They passed the landing area and didn't know it until they found themselves on the map the next morning.

That was the morning of the great beasts. The sun was hot at dawn and the air swarmed with insects, small flying midges, minuscule winged cockroaches, Layard didn't know what they were, but galaxies of them hovered in the air and crawled through the rips in his suit. They were in a large meadow when they saw tree-top high monsters with scoopshovel mouths galloping across the grass ingesting the bugs. There was no place to hide and they could not run. One of the vast creatures stepped on them. It was like being momentarily smothered in dry, whipped cream. The monster was only a degree more substantial than fog and it passed

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on gallumphing, straining insects from the air.

Layard's suit broke down entirely and he was at the mercy of the ambient temperature, too hot during the day and much too cold at night. They endured longer days for the sake of more distance and on the twenty-eighth planetary day, they entered the foothills of the jagged range they had seen so long before, running from coast to coast across the peninsula.

The fat man became almost totally silent as if to conserve his waning strength, but in the late afternoon both his tongue and feet began to wander. Layard put the fat man's good arm over his shoulder and they staggered on beside a stream ad the mountains closed in. They stopped in utmost weariness at the head of a high valley. Ahead was a pass so narrow and deep that it seemed artificial.

"Oh, but I'm glad you're here," said the girl with the checkered hair. She had been sitting on a rock and Layard had dismissed her as a phantom of his fatigue. "Do you have any food? The cliffs are awful and there's no way around and you must help me." She stood and Layard saw that she was naked. She turned to a man approaching them and he could see the striations left by the rock.

"Don't look so smart now, do you?" said the man. "Went the wrong way. Couldn't understand your maps and needles? Come on girl, I found an untouched tree up the hill a bitsy."

"You're sure you don't have anything to eat? All right, Amory, I'm hungry, too." The fat man sagged to the ground. "Leave him there," she invited. "You can come with us."

"Wup-what's the matter with him?" asked the man with the watery eyes. Layard answered briefly and asked what had happened to the others. "There's a hup-hot spring and the pup-people without clothing usually sleep around it. We've been trying to get over the mountain, but it's impossible. There was one man who was going to swim around the cliffs, but he was attacked by a lot of deadly bub-bubbub-bub . . ."

". . . Irds," said the fat man weakly. "Why the skinnies? How come the nudies?"

"Wup-well, when you walk into the pass your suit melts off. And if you go farther you tup-tingle. And then it gets worse, so everybody who tried ran back out. Oh dearo, dearo, what shall we do? And the day after tomorrow is coming so soon. I'll see you in the morning now. I've got to go look for fup-food myself."

Layard was very weary. He made no sense out of what these people had said. He put a pack under the fat man's head and looked around. All the small branches had been stripped from the trees. They were short trees, the limberlimbs

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that were almost impossible to break off when the branch was over three centimeters thick. He took a drink from his canteen. The fat man was gray and haggard. Layard wiped his face with a damp towel and took the food mill over to the nearest tree. He shoved the grid against a branch, and another and another, and by the time the tree was reduced to a stump, he had more than enough paste for them both.

"We went the wrong direction," whispered the fat man. "The action is still ahead of us. It's got to be a Prodromal site."

"Uh-huh," said Layard. "We'll find out in the morning."

He woke at first light. The fat man was grinding his teeth and moaning in his sleep. Layard was cold and stiff. Every overstrained muscle protested when he went to look at the pass. The sides were nearly vertical for two hundred meters and then flared back and up to perhaps a thousand meters. The gap at the top was four hundred meters wide, and still the lowest section in the mountain range. Both the sides and the floor were made of that peculiar material he had seen once before on another planet, gray-white, seamless and extraordinarily hard. He tossed a rock into the pass. It shook gently on the floor and crumbled and disappeared. He threw in a ball of food paste and the same thing happened.

When he returned, the fat man was in a coma. His mutilated arm was lined with angry red streaks and ugly splotches. Septicemia, more than likely self-infected. Tomorrow was pickup.

People began to stir at the side of the valley where the hot spring was located. As the day warmed they drifted toward the pass and broke into gabbling groups around the limberlimbs when they saw Layard's method of using the analog mill. He paid them no attention while he renewed the poultice.

The checkerheaded girl stirred the fat man with her toe. "He dead yet? He'll die quick and then you can help me."

"Oh, sure," said Layard. "But we don't want to leave the body here. You push him up while I get my shoulder in his gut." She backed away in protest and he noticed her hair was mouse brown at the roots. The fat man groaned when Layard heaved him into a fireman's carry and staggered to his feet.

"Watch out!" she screamed. "You're heading for the pass!"

"Gimme a suit before you go!" yelled a naked man and grabbed Layard's arm. He swung around. His face was a devil mask of strain and rage. The man fell back.

Layard entered the pass and there were no more rocks to stumble over. The floor was two meters wide and he staggered from side to side under the weight. Sure enough, his suit and pack dissolved as he

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walked on. He planted one bare foot in front of another. The voices babbled behind him and grew fainter. Sweat ran into his eyes and his grip on the wrist and ankle of the fat man grew insecure and he humped him higher. He rested against a wall and walked on. He was certain that if he put the fat man down, he would never get the weight onto his shoulder again. Then slowly, confidence and strength flowed into his body.

"Hoo-ha," said the fat man. "Let me down." He leaned against the wall and then stood straight. Layard wiped the sweat from his eyes and stared at him. "Hoaka-keek-oakahoo! Ask me how I feel now," said the fat man. He held up two hands and shook them.

"It's fifty kilometers to pickup," said Layard. "Let's go." He felt wonderful. All his muscles were supple again. He was certain he could run all the way. He laughed triumphantly.

"Pretty quick service," mused the fat man, examining his hand. The inflamed veins and splotches had disappeared.

"Instant regeneration," agreed Layard. "Come on, we've got to get to the huts."

"Hold on, Boondocker. Didn't I see a bunch of people back there through a red haze darkly? We can't be the only ones to make pickup. They'd never let us off home again. We've got to shove them through."

The men and women were indifferent when they returned. Layard was suddenly enraged, consumed with anger. He took a man by the hood and slack of his all-weather suit and slung him five meters through the air into the pass, seized two others by the arms and spun them after the first. He loomed up four meters tall and as the panicked crowd scattered, he ran down the front runners and used them like flails, one in each hand to herd the crowd into the Prodromal pass. While the fat man pushed them through, he rounded up the stragglers by the hot spring and drove them like cattle. As their terror increased at the sight of his devil face and height, their legs lengthened in the pass and they ran like deer out the other side.

The cube ship extended its ramp and the naked crowd of men and women began to file aboard.

"I think the whole peninsula is an experiment in optimums," said the fat man.

"The little guy with the watery eyes doesn't stutter anymore," said Layard.

"Extensible, expansible, contractible," said the fat man, "and all triggered by the unconscious to meet a need. You can't do any of this just by thinking about it." He patted his stomach proudly. "This must be my personal optimum survival configuration."

"Hoopa-keek-keek," said Layard. "Let's get aboard." ■

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P. Schuyler Miller

WHOSE RULES?

I have a niece, now in college, who at the age of five or six could win any game she played. The catch was that you never knew what rules she was using at the moment.

Much the same situation occurs when the literary critics comment on science fiction. They argue according to their own rules, and these are generally not the rules that we, who have grown up with the field, consider applicable. They are likely to be the rules—the standards—that the writer considers applicable to the kind of "mainstream" fiction that is currently "in" with the intellectual Establishment, or some fragment of it.

I am told that in England things are different. (Will Damon Knight, or James Blish, or somebody *please* sell a publisher on an anthology of the best articles about SF in both "serious" and fan publications?) The literary magazines do publish serious discussions of science fiction by people who read it, understand it, and know that it, too, plays by its own rules.

The introduction to "Spectrum 5," the latest of the anthologies of short SF edited by Kingsley Amis and Robert Conquest (Harcourt, Brace & World, New York; 1967; 272 pp.; $4.50), is a good example of English science-fiction commentary. They are commenting on serious reviews of their "Spectrum IV" which judged the book—and science fiction—by mainstream standards that they insist do not necessarily apply to SF: one, that science fiction stands or falls by "style;" and two, that it does not deserve serious consideration because SF characters do not "develop" and are not studied in depth.

Their retort: ". . . We have noted an unfortunate tendency . . . to demand . . . all the structures and depths and levels and characterizations and completenesses which,

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emerging from the English departments, have for so many decades now hung threateningly above ordinary fiction—without noticeably improving it. It would be a pity if science fiction were to become yet another well-policed province of today's or yesterday's literary ideologies."

As to style, Amis and Conquest cite George Orwell's comment that Jack London's stories are not well written, but are well told. They point to the pedestrian style of Jules Verne's books—and that they are unforgettable. They offer John Campbell's "Who Goes There?" as a prime example of what Robert Heinlein dubbed "the idea as hero." They tag Ray Bradbury "the great corrupter" for the fanciness that, for me, destroys all but a few of his best stories. They do not comment on what William S. Burroughs is doing with his absurd constructions on science fiction stereotypes; maybe they feel strongly about him.

Being intelligent as well as knowledgeable readers of science fiction, they hasten that more stylists like J. G. Ballard and Algis Budrys—and I would add "Cordwainer Smith," Avram Davidson and a few more—would be welcome. However, they insist, science fiction is a literature *about* something—about ideas, about man's place in the universe, about almost anything. As such, an "efficient prose" like that of Murray Leinster, or Poul Anderson, or Isaac Asimov (their example is Daniel Defoe) is more important than word juggling.

Stylistic merit, then, is not vital to good science fiction, but it is a bonus to be relished when you can get it, and when it doesn't interfere with the content. Characterization, they say, "weakens and deflects" typical science-fiction themes.

The mainstream novelist who is considered good by present standards must explore his characters in depth, and their relationships with each other in all possible permutations and combinations. But most science fiction deals with relationships between people and *things*—machines, real or hypothesized natural phenomena, alien beings, distorted (or even too-familiar) societies. Making characters in these stories nobodies, or stereotypes, is a positive way to emphasize the importance of the basic theme or idea of the story (Tom Godwin's "Cold Equations," Fritz Leiber's "Coming Attraction," Richard Matheson's "Dance of the Dead"—just identified for me by readers of the fanzine *Yandro*). To build up the characters is to tear down the purpose of the story.

I had originally intended to disagree on this point, and find I don't. I meant to point to the very real, warm characters in recent paperbacks by Ted White . . . to the people in Edgar Pangborn's "Davy" and Zenna Henderson's stories about the "People." But on looking again, these are not really examples

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of "idea" science fiction. White's are fresh versions of familiar formulas. Pangborn's and Henderson's themes are very simple. It may be that the writer of science fiction can afford the luxury of characterization—or of a distinctive style—only when his story is not one of ideas or that tries to invert the reader's viewpoint to give him a new perspective on himself and his world.

And yet . . . and yet there are the few stories like Daniel Keyes' "Flowers for Algernon," which by the time you read this may have won the 1967 "Hugo" for best novel of the year. This is a book, as it was a short story, that would be nothing without both its theme and the characterization in depth of its narrator. It is a story about a strange and terrible—and possible—thing that happens to a person whom you must, and do, see as real.

Don't you—don't we all—know people who have lived out a long lifetime without "developing" beyond a pattern conditioned into them in childhood and adolescence? Who pass unchanged through the most appalling crises? Who live and react and die as the stereotyped characters of the soap operas—and science fiction—do? "Everyman" has status in intellectual circles: he is a literary archetype. Put him in a science-fiction story, and he becomes a stereotype. But is he really different?

I think he is. In the present mode of mainstream fiction, he is a symbol for a humanity to whom the world—society, the System, the Establishment, whatever—does things. He may struggle; he may fight back; he will certainly scream and make speeches; but he is essentially passive—a born loser.

The Everyman of science fiction, on the contrary, does things to the world. He is the subject, not the object, of the action. He schemes, he fights, and he may talk too much, but he assumes that he can and will win . . . and he usually does.

Which attitude, I wonder, is likely to give mankind another five or ten thousand years of civilization on Earth or among the stars? Which is more likely to keep Man alive for another half million years as a thinking being in control of his environment? Which standards are more mature—the negative preoccupation with form and style-for-its-own-sake of mainstream fiction, or the positive conviction that the world has structure and meaning, and so should fiction?

COWLES ENCYCLOPEDIA OF SCIENCE & TECHNOLOGY

Cowles Education Corporation • New York 10022, N.Y. • 510 pp. • $9.95

This one-volume encyclopedia intended for the high-school level, I gather, would not have been reviewed here, but that as a reader-protection service, I feel it necessary. Mechanically and artistically, it's very well done; the printer has

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nothing whatever to be ashamed of.

The editorial staff has.

There's a beautiful set of anatomical drawings, done with full-color acetate overlays to suggest three-dimensional arrangement. No fault of the artist—but the diaphragm located as shown would make breathing impossible.

The discussion of nuclear reactors states that the original Fermi atomic pile used graphite blocks *to absorb neutrons* to control the reaction. Inasmuch as the graphite was there for the specific purpose of *preventing* neutron absorption by U-238, that statement rates as a full-fledged goof. In the discussion of fusion reactions, the statement is made that this involves "combining two hydrogen atoms to form helium." Two protons—hydrogen atoms—do not combine to form any helium isotope—it takes four hydrogens, or two *deuteriums*.

The table discussing the elements, their properties and uses is loaded with errors of fact and/or emphasis. Under "Uses" for Germanium it reports only that the oxide is used in treating anemia. Thorium, it says, is used for making Wellsbach mantles for illumination. Silicon is reported as used in steelmaking, and the oxide for glass manufacture. Magnesium is used for photoflash bulbs.

Evidently whoever compiled that sparkling information got his data from a forty-year-old textbook, which didn't mention transistors power diodes, or light-metal structural alloys of magnesium. And hadn't heard about thorium as Man's primary reserve of fertile nuclear-reactor material.

It also says that Thorium is "very radioactive." Inasmuch as it has a half-life of fourteen billion years, this can hardly be called "very" radioactive.

I couldn't check their chapter on electronics and computers; they haven't any. The date of publication, by the way, is 1967.

In their electrical engineering chapter, they have a drawing of a transformer with primary and multi-tapped secondary, which is said to be an "autotransformer." Inasmuch as an autotransformer is characterized by having a *single* coil, tapped at one or more places, the diagram is anything but illuminating to the earnest student.

The astronomical section, while generally well done, has not been influenced by any of the Johnny-come-lately data such as the radar determinations of the rotation of Mercury and Venus. My 1930 Astronomy text gives the data this 1967 encyclopedia uses.

There are many areas covered in the book which I can't attempt to evaluate—agronomy, cultural anthropology, biology—which may be Grade A #1, accurate and well-done material. But in those areas where I do know something about it, the errors are major, very numerous, misleading, and the data is in

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many instances massively outdated. In the chemistry area, it states that fluorine forms compounds with all elements except oxygen and the members of the argon family. This statement is also made in J. W. Mellor's excellent "Inorganic Chemistry," 1928 edition.

NASA a few years ago made some tests with oxygen fluoride as a high-energy rocket-fuel oxidizer. And a lot of work has been done now on the xenon fluorides, oxy-fluorides, and oxides.

Suggestion: Tell your local librarian this one is *not* a satisfactory reference text! J.W.C.

INTELLIGENT LIFE IN THE UNIVERSE

By I. S. Shklovskii & Carl Sagan • Holden-Day, Inc., San Francisco • 1966 • 509 + xiv pp. • $8.95

This is a book that every reader of Analog should certainly read, and I have no doubt that many of you did so long before I was able to get my hands on a copy. If you have had the same trouble, I'd advise getting in line at your public library; the publisher is small, not known to bookstores, and apparently doesn't have or share in effective salesmen.

Shklovskii is a Russian astrophysicist, a leader in radio astronomy, and author of a book written to honor the fifth anniversary of the first Sputnik. "Vselennaia, Zhizn, Razum" ("Universe, Life, Mind") was published in Moscow in 1963 and has been widely translated and excerpted. Sagan is the Harvard astrophysicist and NASA adviser who has been making an intensive study of the possibilities and probabilities of life on other worlds. The two men have collaborated to make this English edition not merely a translation but an extension and revision of Shklovskii's book. Astronomy has long been the most truly international of sciences, and in spite of some touches of ideology and overeagerness to credit the often complex national affiliations of the scientists cited, "Intelligent Life in the Universe" stands as a monument to intelligent life here on Earth.

It is, in addition, almost the one-volume review of present thinking in astrophysics and cosmogony that most astronomers would say cannot be written. For Shklovskii and Sagan have recognized that any valid thinking about the existence of intelligent beings in our and other galaxies requires that the reader know something about what the stars and galaxies are like, how they are created and evolve and produce planets, what life is and how it in turn develops on certain worlds. All this they spell out, fully and clearly, in the first two thirds of their book. "Far-out" conjecture does not really begin until Chapter Twenty-six.

Here you will find that many or most of the old stereotypes of run-of-the-mill science fiction, based on out-of-date textbooks written by retired professors, have been dis-

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missed by astronomers long ago. The evidence has been in the technical literature all along, of course, but only the professionals or nonprofessionals with access to complete technical libraries and competence in several languages could hope to keep up with what is published. The data and ideas that haven't yet gotten into print surface only in the after-hours discussions among professionals, and only two such thoroughly professional men as these can do them justice. Here is a book that science-fiction writers can use as a trustworthy source of new ideas and a means of reevaluating their old ones.

There are relatively few bothersome typographical errors that might confuse a nontechnical reader as they evidently confused whoever read proof for the publisher. The illustrations are lavish and excellent, and from the credits are largely a contribution of Sagan's, though he may not have seen page proofs with them in place (Figure 17-1 is a positive, but is discussed in the text as a negative; Figure 21-4 is rotated 90 degrees counterclockwise).

There are too many rich revelations of current astronomical discovery and discussion in the book to attempt a sampling here. You won't read the book at a sitting, but you'll find it hard to leave for long. If you can't find it, let me tempt you with the authors' conclusion—carefully backed up in the text with facts and probabilities:

In our own galaxy there may be fifty thousand to a million technical civilizations more advanced than our own. Their average age is some ten thousand years. They inhabit the planets of stars between a few hundred and a thousand light-years from the Sun and Earth.

On the jacket, Isaac Asimov calls the book "sheer pleasure." I agree. I wish I'd found it sooner.

ORBIT 2

Edited by Damon Knight • G.P. Putnam's Sons, New York • 1967 • 255 pp. • $4.95

In case you've just come in, "Orbit" is the name of a new series of annual collections of new science fiction, appearing for the first time in these hard-cover anthologies. This is the second, with ten stories by big-name writers and small.

The book opens with "The Doctor," a short vignette by Ted Thomas in which a time-traveling M.D. finds himself marooned in the early Stone Age. (I think the aborigines are a bit too advanced for half a million years ago—the time of *Homo erectus*. Maybe they're us, half a million years from now.)

Kate Wilhelm takes the honors with "Baby, You Were Great," an extrapolation of our television syndrome and a commentary on what kills people like Marilyn Monroe and Jayne Mansfield.

The late Richard McKenna, author of "The Sand Pebbles" and of some very good SF, hadn't sold

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"Fiddler's Green" at the time of his death. It's not up to his own standards—a long fantasy about men in an open boat who save themselves by retreating into a kind of composite dream world.

"Trip, Trap," by Gene Wolfe—one of the new names—is a comedy about a stuffily naïve archeologist—at least, he has a Ph.D.—on a boisterously barbaric world who has to cope with what, for the sake of the title, is called a troll. Good deadpan low fun.

"Philip Latham," an alias for astronomer Robert S. Richardson which was once well-known in these pages, is back with a pleasant near-documentary about a tensionless crisis in a great observatory, "The Dimple in Draco." It's understated from first to last, and you'll find it grows on you.

Joanna Russ, another newcomer, launches a new series of sword-and-sorcery chronicles with a brunette heroine—not a big-muscled hero. "I Gave Her Sack and Sherry" introduces Alyx; "The Adventuress" sees her on her way. The gently mocking attitude of the author and her heroine saves the stories, which belong somewhere between the exploits of Fritz Leiber's "Grey Mouser" and Ted White's newly introduced Elron.

R. A. Lafferty's "The Hole on the Corner"—out of which monsters come—belongs in *Mad*. I can't describe it without doing it wrong. This just might be crazy enough to get into Judith Merril's annual next year, if she's in a light mood when she makes her short list.

Having had to lose twenty-three pounds in the last few months, I am inclined to wince at Kit Reed's burlesque of anti-dieting, "The Food Farm," an impassioned ode to gluttony and gluten bread. But is it science fiction? Aren't there really such places out in the suburbs?

Finally, Brian Aldiss closes the book with "Full Sun," a bizarre little story about a werewolf hunt in the far future

These ten stories would make a fat, outstanding issue of a magazine like *Fantasy & Science Fiction*. But are they worth $4.95 to anyone but a library? If so, the series will continue.

SPECTRUM 5

Edited by Kingsley Amis & Robert Conquest • Harcourt, Brace & World, New York • 1967 • 272 pp • $4.50

These annual anthologies by two English students and sometime practitioners of science fiction are intended to give British readers a taste of good American science fiction with which they are not familiar. The stories are consequently likely to be overly familiar to American readers, and especially to readers of Analog, from whose back issues many of the stories come. Seven of the eight stories in this fifth volume were first published in Astounding Science Fiction—the ex-

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ception is from *Galaxy* of the same era.

Because of this, and because most of the stories have been much reprinted in other American anthologies and short-story collections, I am going to do no more here than list the stories with their original dates, and say that they are all good and should be as useful for indoctrinating "green" readers in the U.S. as in England. The editors' introduction is one of their most thought-provoking: basically, it questions whether the criteria of "good" mainstream fiction apply to science fiction at all.

Now, here are the stories: "Student Body," by F. L. Wallace, (*Galaxy*, 1953); "Noise Level," by Raymond F. Jones, (Astounding, 1952); "Crucifixus Etiam," by Walter M. Miller; "Mother of Invention," by Tom Godwin, and "Commencement Night," by Richard Ashby (ASF, 1953); "The Far Look," by Theodore L. Thomas (1954); "Grandpa," by James H. Schmitz (1955); and "Big Sword," by Paul Ash (1958).

Your library should by all means have the book. You may want to wait for the paperback.

TIME PROBE

Edited by Arthur C. Clarke • Dell Books, New York • No. 8925 • 238 pp. • 75¢

I missed the hardback edition of this anthology, published last year by Delacorte, Dell's parent, or at least associate, in a corporate family. It is a set of eleven stories, practically all of them well known and eight of them originating here in Astounding and Analog, each chosen to represent a different science. The oldest is biologist Julian Huxley's "The Tissue Culture King" from 1927; the newest is Theodore Thomas's "The Weather Man," here in 1962.

Since the stories are nearly all classics, there is no need to try to describe them all. I'll be content with listing them with the sciences they embody.

Mathematics is represented by Robert A. Heinlein's "—And He Built a Crooked House." For cybernetics we have Murray Leinster's underrated classic, "The Wabbler," and for meteorology the abovementioned "Weather Man." Robert Silverberg's "The Artifact Business" is built around an aspect of archeology that always makes me wince —the fact that prestige and financial rewards seem inversely proportional to the scientific competence of a dig. In "Grandpa" James H. Schmitz, on behalf of exobiology, creates a typically involved ecology. Isaac Asimov's "Not Final!"—one of the stories that is not as well known as it should be—stands in for physics and Cyril M. Kornbluth's "The Little Black Bag" for medicine.

For astronomy we might have had almost anything, including the editor's own award-winning "The

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Star." What we get is a documentary sleeper from "Philip Latham" —astronomer R. S. Richardson— "The Blindness"—which merely reports the return of Halley's Comet in 1987. Editor Clarke's own contribution is the very slight "Take a Deep Breath," assigned to physiology, and Jack Vance gives chemistry—ceramics—its due in "The Potters of Firsk." The Huxley story—by scientist Huxley, not the author of "Brave New World"—ends the book.

If the hardback turns up in a book sale, that's the one to get as an example of one of the best anthologies of familiar stories that we've had. I hope the libraries didn't overlook it. Meanwhile read the paperback.

THREE HARDBACK REPRINTS

THE CITY AND THE STARS

By Arthur C. Clarke • Harcourt, Brace & World, New York • 1967 • 310 pp. • $4.95

Clarke's poetic vision of the far future and Man's place among the star-worlds. His introduction says that the original version, "Against the Fall of Night," comprises only about a quarter of the book in this, its final form.

THE SANDS OF MARS

By Arthur C. Clarke • Harcourt, Brace & World, New York • 1967 • 218 pp. • $4.50

The other Clarke, author of documentaries of the future. Here is his first novel, and the first realistic novel about Mars as it evidently is, and its terraforming into a world men can inhabit.

FAHRENHEIT 451

By Ray Bradbury • Simon and Schuster, New York • 1967 • 192 pp. • $4.95

The film of Bradbury's famous story—not as good as it should have been, considering the cast and director—doubtless suggested to S&S that they should reprint the 1953 Ballantine edition complete with the two other stories included in it: "The Playground" and "The Rock Cried Out." The Ballantine pb edition is also still in print with new cover illustrations.

PAPERBACK REISSUES

WAR OF THE WING-MEN

By Poul Anderson • Ace Books, N.Y. • No. G-634 • 160 pp. • 50¢

Just about the best of Poul Anderson's stories of Nicholas van Rijn and the galaxy of the Polesotechnic League.

WAR WITH THE NEWTS

By Karel Capek • Berkley Books, N.Y. • No. S-1404 • 241 pp. • 75¢

New pb edition of the last classic satire of man and war, by the creator of the word "robot."

SUPER SCIENCE STORIES

By Richard M. Elam • Lantern Press, New York • No. 50526 • 231 pp. • 50¢

A collection of not very good

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science fiction shorts for teen-agers, originally called "Teen-Age Super Science Stories."

THE BODY SNATCHERS

By Jack Finney • Dell Publishing Co., New York • No. 0674 • 191 pp • 60¢

You must have seen the film on TV. The title page calls it a "Dell First Edition," but this is the third pb printing since 1955.

THE BIG TIME

By Fritz Leiber • Ace Books, N.Y. • No. G-627 • 129 pp. • 50¢

Reissue of the grand yarn about the time-war of the Snakes and the Spiders.

GLADIATOR

By Philip Wylie • Lancer Books, New York • No. 73-562 • 191 pp. • 60¢

Wylie's classic superman story, back in print in paperback.

NEW PAPERBACK REPRINTS

THE FURY OUT OF TIME

By Lloyd Biggle, Jr.• Berkley Books, New York • No. X-1393 • 223 pp. 60¢

Something new in time forces in the liveliest time travel story of 1965.

SLEEPING PLANET

By William R. Burkett, Jr. • Paperback Library, N.Y. • No. 54-445. • 285 pp. • 75¢

Serialized here in 1964, and a good if not great yarn, too.

CITIES OF WONDER

Edited by Damon Knight • Macfadden Books, New York. • No. 75-183 • 251 pp. • 75¢

Reprint of last year's excellent "theme" anthology—stories about cities.

THE ANT MEN

By Eric North • Macfadden Books, N.Y. • No. 60-277 • 175 pp. • 60¢

Reprint of one of the worst of the former Winston juvenile SF series. I once insulted Andre Norton by confusing her pen name, "Andrew North," with this Australian writer.

THE NINTH GALAXY READER

Edited by Frederik Pohl • Pocket Books, New York • No. 50532 • 229 pp. • 50¢

The 1956 collection—one of the best in a good series.

CODE THREE

By Rick Raphael • Berkley Books, New York • No. X-1394 • 176 pp. • 60¢

The grand stories about the crew who patrol the North American Continental Thruway System—one of the best recent examples of the "ASF formula" of technological extrapolation.

THE WINGED MAN

By A. E. van Vogt & E. Mayne Hull • Berkley Books, N.Y. • No. X-1403 • 159 pp. • 60¢

The original version of this story was here in 1944. The hardback edition appeared last year.

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brass tacks

Dear Sir:

I may be your most faithful non-subscribing reader. I don't think that I have missed an issue in thirty years, all purchased at newsstands. This is my first letter and concerns "Connecticut Yankee" fiction. You might also call it a belated reaction to the late H. Beam Piper's "Lord Kalvan of Otherwhen."

If what I say seems critical, I had better note that I always admired Piper's work and enjoyed it immensely. Recently a celebrated movie director who just happened to be a bona fide Count of the Holy Roman Empire made a movie about the Haute Noblesse of Nineteenth Century Sicily based on a novel by a member of the same nobility from a later generation. That movie had *authority*. Piper writing about Calvin Morrison had the same sort of authority. "Lord Kalvan of Otherwhen" brought out Piper's peculiar strengths at all points and this is not the least tragic aspect of a very tragic death. All science-fiction fans are poorer by his death.

But the very strength of Piper's work brought into relief what must be necessarily a stumbling block to all "Connecticut Yankee" fiction, the technological factor. Piper's handling of the technological factors was always sharp but never *profound*.

As an example of his acute insights, there is the backward flintlock on the muskets of Hostigos. That was the most immediate inspiration of the thoughts behind this letter because consciously or unconsciously, he may have solved the problem that frustrated six generations of gunsmiths: How do you make a breech-loading flintlock???? The idea that Eighteenth Century gunsmiths did not have the know-how to make breechloaders is Victorian mythology. They not only did have the know-how to make breechloaders but they did make breechloaders that were used. The

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most notable example was the breech-loaded flintlock rifle used by Patrick Ferguson's Tory Rangers in the American Revolution. The Tory Rangers were issued a rifle that used a threaded screw plug in the breech. It was very practical on the practice range and very impractical in the field. The few surviving examples are collector's items that are reported to work perfectly. But that was before the days of Whitney, Blanchard, Colt and the system of interchangeable parts. Each screw plug was fitted to the breech of just one rifle. If that screw plug was lost, the rifle was useless. Incidentally, I have never seen this mentioned in *any* account of the battle of King's Mountain where Ferguson was killed and his Rangers captured. There is such a thing as premature progress.

Ingenious gunsmiths produced a variety of breech-loading flintlocks. Marshal Saxe and other experiment minded soldiers had gunsmiths make others to their prescriptions. None worked. As near as I can figure out, the only idea that was never tried was the sliding breech which eventually solved the problem.

Anyone who is fascinated by the technological blind alleys of history will spot this immediately as typical, almost atypical. Prolonged effort by ingenious mechanics and inspired inventors failed to solve what in the end turned out to be a very simple problem. Why??? Well, in this case, if you look carefully at the breech area of an antique flintlock you will notice that a sliding breech is *incompatible with the standard flintlock mechanism.* The gunsmiths of the Eighteenth Century were trying to make a breech-loading device to go with the firing mechanisms they knew. They never saw that they *needed not one invention but two inventions.* The invention of the practical breech-loading rifle came only after the invention of the fulminate percussion cap.

This brings us back to H. Beam Piper. When I read his description of the backward flintlocks in "Kalvan," my first thought was that an ingenious gunsmith would be able to fit such a lock with some sort of sliding breech and produce a practical breech-loading flintlock. I will always wonder if Piper had spotted the possibility but I don't think anyone will ever know.

But let's take another look at the Connecticut Yankee problem. Let's say that Smith, our hero, is back in Rome when Hannibal was at the Gates. The Consul is inclined to call Smith a Gaul or Greek and bury him alive in the Forum according to standard Roman procedure in times of crisis. Smith claims military expertise that will help the Romans. The Consul will try anything once but Rome is bankrupt and the army unpaid. Smith had better come up with something quick and it had better be easy to

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make and above all cheap. What???? Smith fortunately has read his military history and has the answer almost immediately. Guess?????

Or let us say that Jones has fallen into the hands of a villain with the time machine. The villain finances his time machine by removing inconvenient people to other times for pay. There are people who find Jones inconvenient. But the villain is a good-natured type. He gives his victims choice of time and place and within reason will furnish any books and equipment that the victim thinks will help him. Jones picks the Court of Frederick the Great. He asks for reference works on Cement and Concrete Technology. He also requests reference material on Pyrotechnics. Why????

I think I will leave the Frederick the Great one unsolved. The answer in the Roman case is counterweighted artillery or mangonels. If this seems a strange invention to offer the hard pressed Romans, go back and read the history. In spite of spectaculars like Cannae and Zama, the Hannibalic war was actually an endless series of sieges of overgrown villages hard to find on the map. One of the curious things about the war was that neither the Romans nor the Carthaginians seem to have ever used siege machinery. Archimedes you say??? But Archimedes was a Greek defending a Greek city which could fairly describe itself as ground between the upper and nether millstones of Rome and Carthage. Incidentally, the Archimedean machinery was built and installed under a pro-Roman government and there is reason to believe that Archimedes belonged to the pro-Roman party.

It is important to note though that the siege machinery or artillery available seems to have been exclusively torsion artillery. Torsion artillery was superior to counterweight artillery in just about every single aspect but torsion artillery in the time of Hannibal was a monopoly of a small body of Greek technicians who were highly paid, allergic to non-Greek employers and campaigns under canvas, cantankerous and spoiled. That last means that they were not only highly paid but that they were paid on time or else. Legend to the contrary, Rome and Carthage were both always short of money. Hence the only torsion artillery in the Hannibalic war was that used against the Romans at Syracuse.

Counterweight artillery while much less efficient could be easily mastered by any competent carpenter-mechanic. For some reason, it was not discovered until the middle ages. This seems to have been because once again two inventions rather than one were needed. Technological blind alleys usually seem to be a matter of two inventions instead of one. There will be in each case, an invention

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whose need can be seen which cannot be invented until an invention for which the need cannot be seen has been invented. In the case of counterweight artillery, the invention of unseen need was a sling attached to the throwing arm of the mangonel. The throwing arms of torsion artillery (onagers) needed no slings. Strangely, there were available in the days of Hannibal slingers who could use slings to throw darts. Ancient writers tell fantastic things about Hannibal's slingers and the sling has been called "the machine gun of antiquity."

The dual invention blind alley is not the only thing to be considered in a "Connecticut Yankee" story. There is the question of the state of the art. What could the "mechanics" or "fabri" be expected to accomplish under the coaching of the "Yankee." As an example, I found it difficult to conceive of the gunsmiths of Hostigos making rifles. A better example would be from the history of Artillery. An ingenious officer from Wellington's Artillery at Waterloo would have been able to furnish Marlborough or possibly even Cromwell with Napoleonic artillery. But a Prussian artillery officer of 1870 would not have been able to equip Blucher with the artillery of Sedan. The artillery that made Napoleon and Nelson possible was created by the utilization of things possible at any time in the Eighteenth Century. The artillery of Moltke was the result of such fundamental discoveries as Bessemer steel.

This leads to another line of thought; that a "Connecticut Yankee" lost in the past would find most useful inventions that were never made. As an example, it is known that the Romans were able to make brass or zinc bronze although they were unable to smelt zinc. They had some trick of cooking metallic copper and zinc ores together. This might be called indirect alloying. All development of new metals and alloys in modern times has been in the direction of direct alloying. Metals are first extracted from ores and then mixed in relatively pure form. Archaeologists on the other hand are beginning to suspect that much early bronze was the result of indirect alloying.

However, let us look at it from the point of view of "Yankee." Recently, it was discovered that the addition of a very small amount of magnesium to cast iron made it malleable iron. It would be hard to think of anything more useful than this for any society that had cast iron before the Bessemer process. But before Jones tries to sell that idea to the Consul, he had better study technological history. The Romans had no cast iron. Cast iron was first made by the Chinese about the beginning of the iron age but it was not known in Europe until after the Mongols had given

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European craftsmen a chance to visit China and then go back to Europe.

Another possibility in the field of indirect alloying would be aluminum. For sheer versatility and universal usefulness even in the Twentieth Century, copper-aluminum alloys are hard to beat. Since the first copper ax head, there has never been a time when aluminum bronze would not have been a hit.

The general conclusion is that a "Connecticut Yankee" in practice might find himself struggling to make inventions that were bypassed and never made in real life. There are also the belated inventions. Lewis Mumford noted that all the early inventions in the field of electricity, batteries, dynamos, motors, commutators, et cetera, were all possible to anyone with the theoretical background for a century or two before they were actually made. Other inventions were made almost immediately after they became possible.

I have amused myself by asking friends what invention they would try to sell if they became a "Connecticut Yankee" at various times and places. It is usually possible to demonstrate that the invention mentioned would be very inadvisable. On the other hand, the practical possibilities can be unexpected. I don't know much about electroplating but I suspect that Smith could have made a hit with Frederick the Great by chrome plating the barrels of the king's cannon.

If you can figure out Frederick the Great's interest in concrete and pyrotechnics, let me know.

NORMAN PHELPS
1505 N.W. 45th
Oklahoma City, Okla. 73118

Yankee Smith might have shown the Roman Consul how to make a horse collar, thereby solving Rome's economic problem, and the military logistics problem.

On the other hand, while zinc can be directly smelted with copper to yield brass, and aluminum bronze is a magnificent alloy—it looks like gold and is almost as noncorroding —I don't quite see how you'd smelt aluminum and copper together. There's no reducing agent that'll free Al from its oxide!

And while magnesium may improve cast iron, the high-order electrochemical technology metallic Mg requires implies a steel technology already existent. True, Mg can be produced by a distillation process—but that involves electric-furnace temperatures, and a level of firebrick and structural integrity technology equally difficult.

If you're going to go in for extremely-hard-to-refine metals—why not give Hannibal some beryllium-bronze technology? Hard as steel, nonrusting, makes springs far superior to steel for bows and artillery. And it'd be interesting to see how a commercial empire dominant in the Mediterranean would change history!

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DEMOCRACY

continued from page 5

fact that such a treaty had been foisted on Jordan would be enough to trigger the Jordanian people to restart the war.

What's needed to settle the problems in the Near East is a good, sound, powerful totalitarian tyrant, with the power and the iron determination to use that power as needed, who could and would beat the Arab peoples into forced recognition of the facts of the real world around them. To brutally yank them out of their LSD hallucinatory world in which they dream that *they are now* a great and modern power. Sure—once the Muslim peoples were the world's leaders in Science, Technology, in philosophy, the arts, and in government; they have a great history. Egypt was the world's great source of civilization for twice as many millennia as have elapsed since Rome fell flat on its face.

But they aren't now—and haven't been for most of the last millennium. Which is a fact they, the people, do not care to acknowledge. In the Six-Day War, Israel demonstrated with shattering completeness that the finest of modern technical equipment, in ample supply, with adequate supplies of highly competent Russian instructors, did not convert a people a millennium out of date into a modern army.

The Arab armies had more and equally good technical equipment; their weapons were first-class.

Their people, however, are a backward people—they're turned around and looking backward to an immense and glorious past. And dreaming that *they* did those great things. *They* didn't; it was their remote and daring ancestors, who surged across the world, with new, tradition-breaking ideas and ideals.

What is absolutely essential in the situation that *really* exists now, in the real world, is to get the Arab peoples to abandon their deep, strong, emotional convictions, to accept that their Old Time Culture is now as magnificent—as admirable—but as dead a ruin as Cheops Pyramid, or the Sphinx.

By its very definition, Democracy can't do that; the will of the people is to maintain things the way they want them—the way they are. To be a *leader*, any President of an Arab nation must carry out what the people want, and organize them to maintain that desired goal.

What's needed is a *driver*, a tyrant, who will force the people to give up what they truly want, and accept what they truly must.

In the real-world situation that exists in the Near East now, Democracy, by its very definition, won't work. The people of the Arab nations deeply, wholeheartedly and genuinely want Israel not to exist.

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No government that acknowledges it does exist, by signing a treaty with Israel, will be a Democratic government, therefore. And the outraged people will demolish any such government immediately and violently—and probably immediately restart the war against Israel.

I now invite you, Dear Reader, to play a quite unfunny game. You can try it on friends—those you don't mind losing particularly.

"You have just been made Controller of the World; you have authority over all the world, and responsibility for all the people of the world.

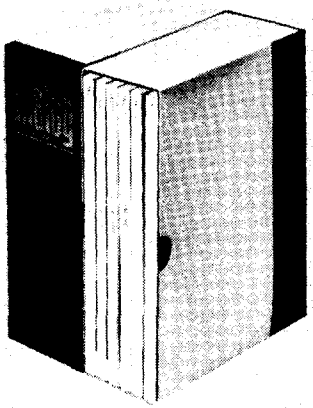
"What are you going to do about the Middle East?"

Of course, the minimum-effort, least-loss-of-life quick solution would be to abolish Israel, re-disperse the Jews, and let the Arabs go back into their millennia-long LSD dream of being still a great and world-leading civilization. I.e., to be a Democratic Leader for the Arab point of view.

How are you going to get it over to those Arab peoples that, to be the first-class citizens of the world they think they are, *they* have to change, *they* have to give up their beloved traditions?

By being a ruthless, dictatorial tyrant, perhaps?

Go ahead—propose a solution! The only limits are your imagination—and the implacable realities of a real world. ■ The Editor.



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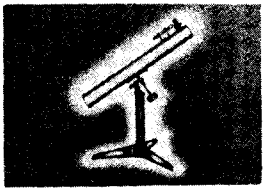

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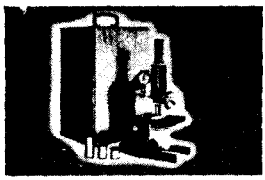

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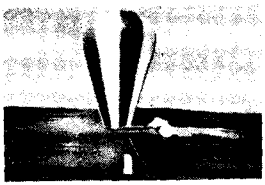

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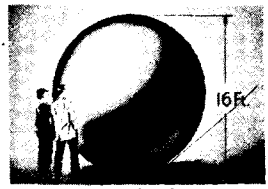

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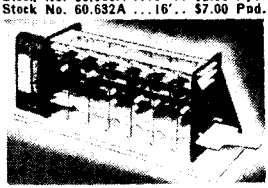

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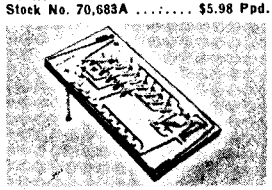

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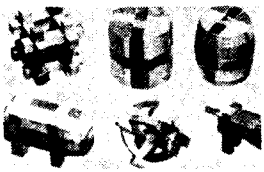

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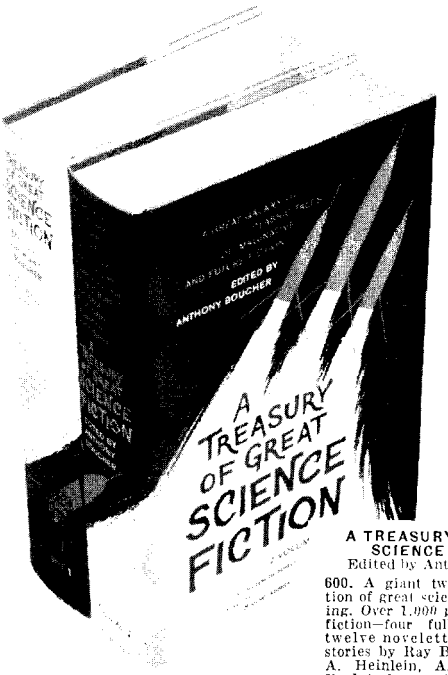

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